

# ***SCHMIDT offers the worldwide largest selection of Tension Meters***

MORE THAN  
**70**  
YEARS

 made  
in  
Germany



# A Selection of Tension Meters

The overview of most popular tension meters will help you to find them in our catalog.



**Z Series**  
Page A1 - A2



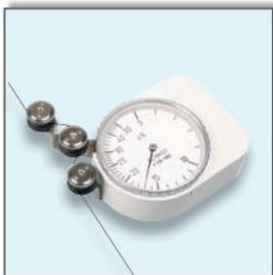
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**Applications**

MODEL Page

Narrow web machines  
Tensioning  
Braiding  
Sewing  
Open end spinning  
Polyester spinning  
Raschel knitting  
Circular knitting  
Warpers  
Sizing  
Carbon winders  
Winding  
Texturizing  
Weaving (loom only)  
Warping  
Twisting  
Strip winding  
Wire EDM  
Wire drawing  
Extruders  
Fine wire drawing  
Fiber optics / Buffer tubes  
Winding and coiling  
Stranders

MODEL	Page	Narrow web machines	Tensioning	Braiding	Sewing	Open end spinning	Polyester spinning	Raschel knitting	Circular knitting	Warpers	Sizing	Carbon winders	Winding	Texturizing	Weaving (loom only)	Warping	Twisting	Strip winding	Wire EDM	Wire drawing	Extruders	Fine wire drawing	Fiber optics / Buffer tubes	Winding and coiling	Stranders	
<b>Hand-held, mechanical</b>																										
ZF2	A2					●		●	●	●			●	●								●		●		
ZD2	A2							●		●			●									●		●		
DX2	A3		●	●					●				●						●	●	●	●	●	●	●	
DXE	A5		●			●		●		●			●	●								●		●		
DXV	A6					●		●		●			●	●								●		●		
DXP	A6						●						●													
DXF/DXL	A7																				●		●		●	
DXK	A8														●											
MKM	A12		●		●																					
DXB	A9	●									●								●							
DXR	A10	●																	●							
DXT	A10	●																	●							
DN1	A13			●						●	●		●						●	●	●			●	●	
<b>Stationary, mechanical</b>																										
Q	B1		●	●			●		●	●		●										●		●		
MK	B2											●										●		●		
DX2S	B2		●				●					●							●	●	●	●	●	●	●	
DXES	B2				●		●		●	●		●	●									●		●		
DXFS	B2																					●				
DXBS	B2	●																	●							
DXTS	B2	●																	●							
<b>Hand-held, electronic</b>																										
PT	C1								●																	
ZEF	C3				●		●	●	●	●		●	●		●	●					●		●			
ZED	C4						●		●	●		●			●	●			●	●	●	●	●	●	●	
DTS	C5		●	●					●	●		●			●	●			●	●	●	●	●	●	●	
DTX	C6		●	●					●	●		●			●	●			●	●	●	●	●	●	●	
DTSE/DTXE	C10		●	●	●		●		●	●		●			●	●					●		●			
DTSF/DTXF	C11																						●			
DTSL/DTXL	C11																					●		●		
DTSB/DTXB	C12	●									●								●				●			
ETB/ETX	C13			●	●		●		●	●		●			●	●						●		●		
ETPB/ETPX	C14				●	●						●														
MST	A12	●			●																					
KXE	C15														●											
<b>Stationary, electronic</b>																										
TS1/FS1	D2/D9		●	●			●		●	●		●			●	●			●	●	●	●	●	●	●	
TSP/FSP	D3/D10				●	●						●														
TSH/FSH	D4/D10																		●	●			●	●	●	
TSL/FSL	D5/D11																					●	●	●	●	
TSF	D5																						●			
TSB1/FSB1	D6/D11	●									●								●							
TSB2	D6	●									●								●							
MZ	D7/D8	●					●	●	●	●	●	●	●		●	●			●			●		●		

**T E X T I L E**

**W I R E**

Subject to change without notice.

This table is for guidance only and does not claim to be exhaustive.

**Please visit us in the World Wide Web!**

**We solve tension-measuring problems.  
More than 70 years. Worldwide.**

In 1948, the founder of the company, Mr. Hans Schmidt, started selling and distributing yarns and textile machinery.

He became aware of the importance which the control of tension had for production processes and soon developed and constructed a 3-Roller Tension Meter which featured one measuring roller and two guiding rollers. This ingenious principle of operation has been proved to be the best method for tension measuring.

MORE THAN  
**70**  
YEARS

The 3-roller measuring system has become the hallmark of all SCHMIDT tension meters and remains unsurpassed in its efficiency even today.

Since 1962, the company's headquarter is in Waldkraiburg, located near Munich, Germany.



In response to today's needs, involving new advanced materials and stricter production standards, SCHMIDT offers a large selection of tension meters and ranges to satisfy those requirements.

Competition is constantly changing. Higher efficiency requirements and continuous quality control make monitoring of tension more important than ever. If, for instance, the winding tension of a **copper wire** is too high, the wire diameter will decrease, resulting in a change in the electrical resistance. With **natural fibers**, excessive fiber tension leads to a change in characteristic.

With **synthetic fibers**, this results in irreversible molecular shifts, which may cause the fabric to dye unevenly.

The inevitable consequence is a product of poor quality.

**SCHMIDT Tension Meters help you to eliminate tension-related defects.**



Today, more than 190.000 SCHMIDT tension meters are used worldwide.







**SCHMIDT offers the worldwide largest selection of Tension Meters:**

- 20 different series,
- 66 models and more than
- 2000 possible variations ...

Wherever precision and superior quality are essential in producing and processing

- Threads
- Yarns
- Fibers
- Carbon fibers
- Split tapes
- Rovings
- Wires
- Cables
- EDM wires
- Steel Cord
- Sawing wires
- Fiber optics
- Tapes & narrow fabrics
- Foil strips
- Films, etc.

SCHMIDT tension meters are indispensable in production monitoring, quality control, automation, and process engineering.

Take benefit of our experience!

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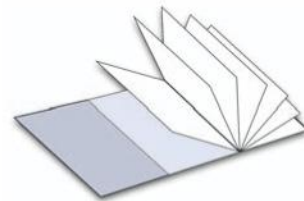
e-mail:  
info@hans-schmidt.com

Internet:  
www.hans-schmidt.com

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**A Hand-Held, mechanical**

<b>Z Series:</b>	Model ZF2, ZD2	A1-2
<b>DX Series:</b>	Model DX2	A3-4
	Model DXE, DXV, DXP	A5-6
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**B Stationary, mechanical**

Model Q, MK, DX2S	B1-2
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**C Hand-Held, electronic**

<b>PT Series:</b>	Model PT-100, PT-100-L	C1-2
<b>ZE Series:</b>	Model ZEF, ZED	C3-4
<b>DT Series:</b>	Model DTS, DTX	C5-9
	Model DTSB, DTXB	C10
	Model DTSL, DTXL	C11
	Model DTSF, DTXF, DTSE, DTXE	C12
<b>ET Series:</b>	Model ETB, ETX, ETPB, ETPX	C13-14
<b>KXE Series:</b>	Model KXE	C15
<b>RTM Series:</b>	Model RTM	C16
<b>CTM Series:</b>	Model CTM, EDJunior, CTME	C17-18



**D Stationary, electronic**

<b>Online Measuring Systems:</b>	D1	
<b>TS Series:</b>	Model TS1, TSP, TSR	D2-3
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	FS-digital (USB, RS 232, RS 422, Wi-Fi)	D13-14
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**E Guide roller dimensions and optional accessories** E1-2

**F Customized designs** F

*SCHMIDT Tension Meters are used throughout the world in a wide variety of typical as well as special applications. A few samples are shown below.*

*Should you need customized solutions for your measuring problem, please contact us. We will be glad to design a model for your special application.*

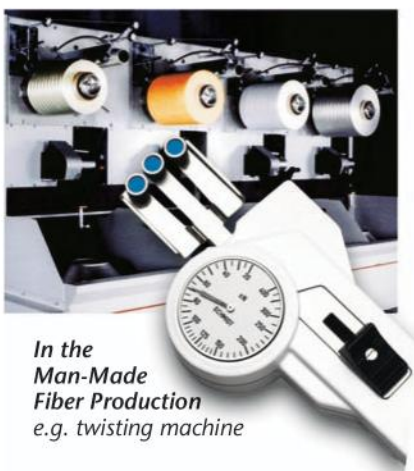
**1<sup>st</sup>** IN TENSION METERS WORLDWIDE®



*In the Optical Fiber Production e.g. winding machine*



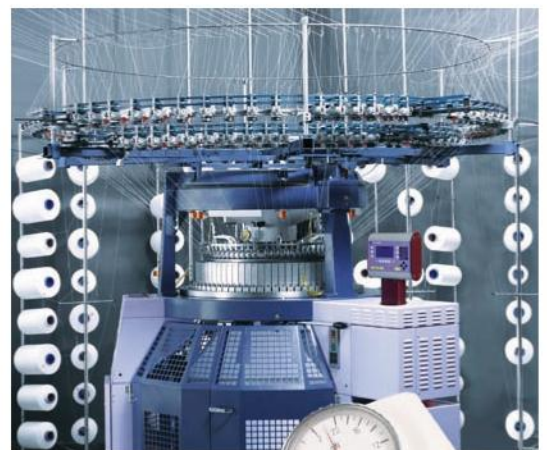
*In the Wire Industry e.g. for wire drawing or winding machines*



*In the Man-Made Fiber Production e.g. twisting machine*

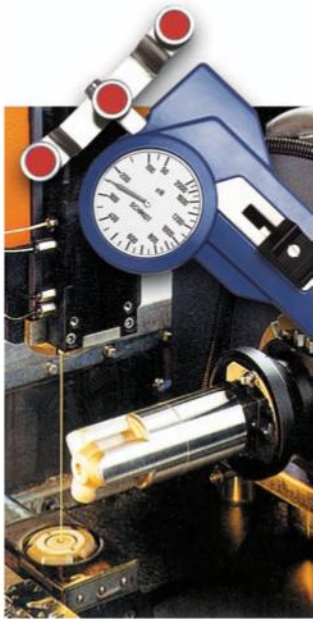


*In the Textile Industry Online tension sensor to control the bobbin creel*



*In the Knitting Industry exact adjusting of yarn feeders of circular knitting machines*





*In the Wire EDM Industry*  
The correct adjusted tension is the condition for best exact cuts.



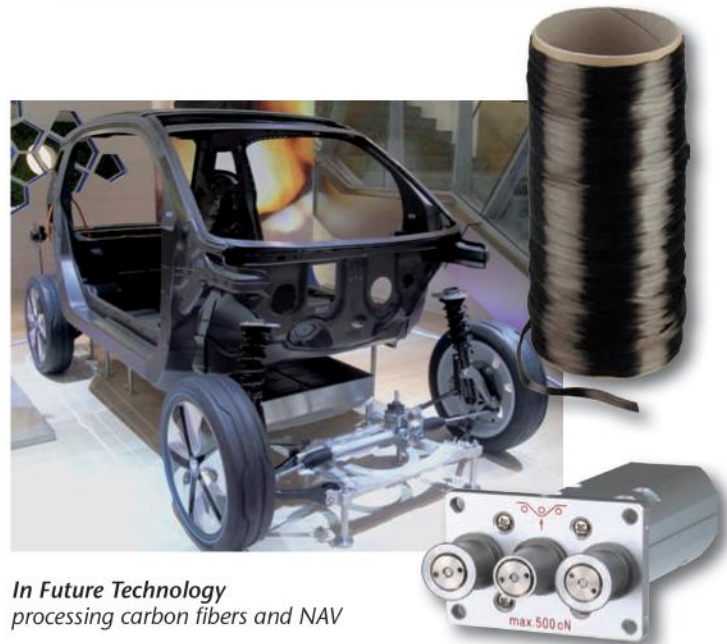
*In the Construction Industry*  
For measuring pretensioned non-moving ropes, tower guy wires, overhead lines, etc.



*In the Automotive Industry*  
producing tires (tyre cord) and Airbag-fabrics



*In the Fiber Producing Industry*  
e.g. for winding machines



*In Future Technology*  
processing carbon fibers and NAV



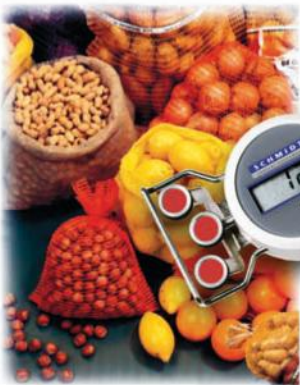
**SCHMIDT Tension Meters are used throughout the world.**



**In the Aircraft Industry**  
producing parts made by fiber-reinforced materials for airplanes on embroidery machines



**In Satellite Technology**  
Before launching accurately tension setting of the cables holding the solar panels



**For Technical Fibers**  
producing harvesting nets and protection nets with warpknitting machines

**1<sup>st</sup> IN TENSION METERS WORLDWIDE®**



**In the Medical Industry**  
e.g. producing bandages and sutures



**In Telecommunications**  
Continuous tension monitoring is essential in the production and processing of copper wires and optic fibers



**In the Sewing Industry**  
For adjusting yarn break on industrial sewing machines e. g. production of airbags





**HANS SCHMIDT & Co GmbH was the first tension meter manufacturer to be certified according to International Standard DIN EN ISO 9001.**

*This emphasizes our continuous commitment to quality which ensures that our staff produces the highest quality products. This also gives you the confidence in a company in which quality and customer service has the highest priority.*

*Because of the very low request for this certificate and the very high costs for the procedure of the certification we decided not to make this certification again. Of course we will work according our quality handbook and the regulations of ISO 9001 furthermore in order to keep our quality standard*

**Calibration Standards:** Since there are no international standards for the calibration of tension meters, we have established and documented a SCHMIDT Standard which is accepted worldwide.

**SCHMIDT Quality Control**

When completed, each instrument undergoes an extensive final quality check ensuring proper operation as well as a **final calibration verification**.

Only those instruments meeting our strict quality regulations receive the **SCHMIDT Quality Seal**.

This is also confirmed in a **Certificate of Compliance with the order 2.1** which is supplied free of charge with the instrument.



**SCHMIDT Inspection Certificate 3.1**

An **Inspection Certificate** according to European Standard EN 10204, which includes a **Calibration Report**, is optionally available. The Calibration Report shows the measured values compared to the standards. This verification of the calibration is performed prior to shipment.

The **Calibration Label** is fixed on the instrument, indicating the calibration date. ISO 9000 – certified companies frequently require such an **Inspection Certificate** to verify inspection of their measuring, inspection and test equipment.

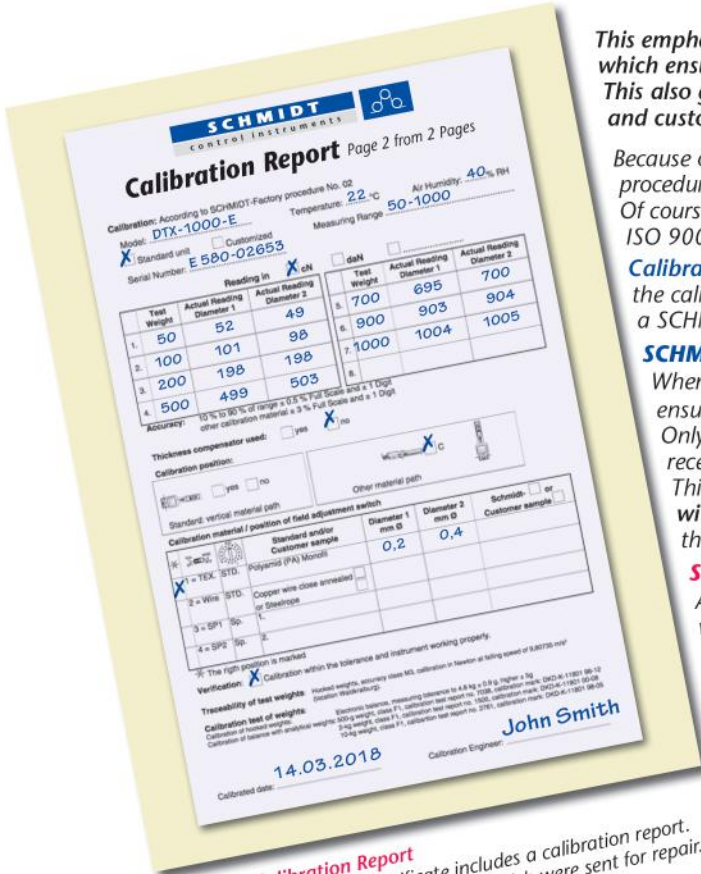
Our **Inspection Certificate** according to EN 10204 is the European equivalent to the test reports of other international organizations, such as NIST (USA) or JAL (Asia).



**Delivery includes:** Tension meter (with carrying case if hand-held model), Certificate of Compliance with the order 2.1, operating instructions in English or German as requested

**1<sup>st</sup> IN TENSION METERS WORLDWIDE®**

**Warranty:** SCHMIDT tension meters are subject to stringent quality checks. We therefore guarantee all our tension meters for 12 months. Improper use, abuse and parts subjected to wear (e.g. guide rollers) are excluded from coverage.



**Sample of Calibration Report**  
The optional Inspection Certificate includes a calibration report. It can be ordered also for instruments which were sent for repair.







## General Information on SCHMIDT Tension Meters

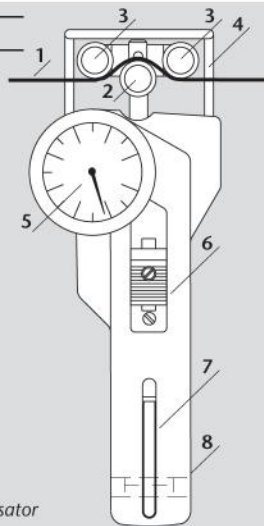
**1<sup>st</sup>** IN TENSION METERS WORLDWIDE®

### Operating elements DX2:

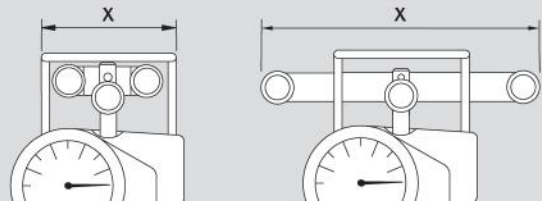
+ All SCHMIDT Tension Meters feature the 3-roller measuring system. The center measuring roller is deflected by the tension of the measured material. This measuring principle assures highest accuracy and repeatability.

+ All rollers are equipped with precision ball bearings.

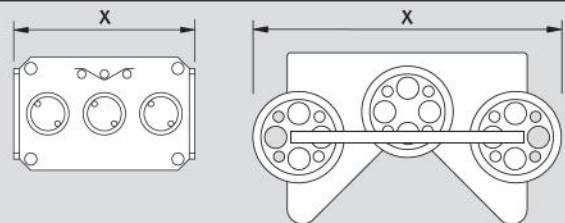
- 1 Measured material
- 2 Measuring roller (center guide roller)
- 3 Outer guide rollers
- 4 Filament guide
- 5 Scale
- 6 Thumbpiece
- 7 Sample holder clip
- 8 Material thickness compensator



### Measuring head width on hand-held instruments:



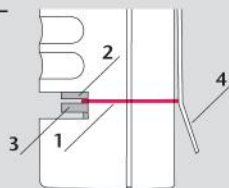
### Measuring head width on online sensors:



+ The width of the measuring head varies with the model design and the tension range. Dimension »X« defines the minimum access space required along the material path. It is determined by the width of the filament guide, the distance between the two outer guide rollers, or the outside dimensions of the front plate, whichever is the largest.

### Material thickness compensator:

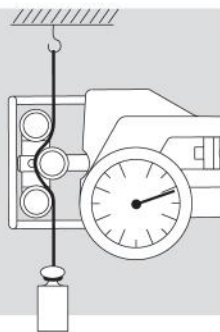
+ SCHMIDT hand-held tension meters are equipped, if necessary, with a material thickness compensator. This exclusive feature is only found on SCHMIDT tension meters and minimizes any error caused by changing material diameters.



1 Material sample 2+3 two Discs 4 Sample holder clip

### SCHMIDT calibration:

+ To ensure highest precision, each Tension Meter is individually calibrated according to the SCHMIDT factory procedure. For calibration a known weight is suspended from the standard calibration material, vertically, as shown in the figure. This method is accepted – worldwide – as the industry standard.



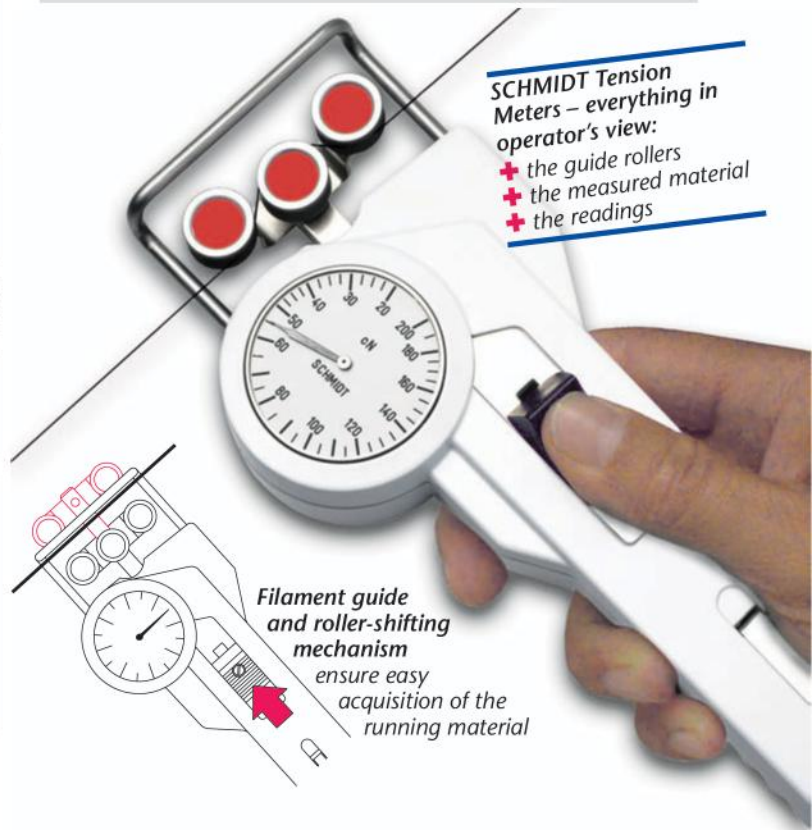
### Special scale for customer materials:

+ Special calibration to customer-supplied material is optionally available. This takes into account the customer material's rigidity and diameter, if it differs significantly from the SCHMIDT calibration material. Special calibration to two different materials is optionally available.



**SCHMIDT Tension Meters – everything in operator's view:**

- + the guide rollers
- + the measured material
- + the readings



Filament guide and roller-shifting mechanism ensure easy acquisition of the running material





## Guidelines for selecting the right SCHMIDT Tension Meter

### 1. Select the desired model:

- **According to your desired use:**
  - Hand-held or stationary model
  - Mechanical or electronic model
- **According to application:**  
Selection Guide

→ see page 3 →

### 2. Determine the appropriate tension range:

- **Recommendations for typical textile and wire applications:**

Tension Range* up to	SCHMIDT Calibration Material**	Textile Industry e.g. yarn count max.	Wire Industry e.g. copper wire, soft-annealed
20 cN	Filament: 25 tex	25 tex	max. 0.05 mm Ø
50 cN	PA: 0.12 mm Ø	50 tex	max. 0.08 mm Ø
120 cN	PA: 0.12 mm Ø	120 tex	max. 0.13 mm Ø
200 cN	PA: 0.12 mm Ø	200 tex	max. 0.17 mm Ø
300 cN	PA: 0.20 mm Ø	300 tex	max. 0.20 mm Ø
400 cN	PA: 0.20 mm Ø	400 tex	0.10 - 0.25 mm Ø
500 cN	PA: 0.20 mm Ø	500 tex	0.10 - 0.25 mm Ø
1000 cN	PA: 0.30 mm Ø	1000 tex	0.10 - 0.40 mm Ø
1500 cN	PA: 0.30 mm Ø	1500 tex	0.15 - 0.50 mm Ø
2000 cN	PA: 0.50 mm Ø	2000 tex	0.30 - 0.60 mm Ø
3500 cN	PA: 0.80 mm Ø	3500 tex	0.35 - 0.80 mm Ø
5000 cN	PA: 0.80 mm Ø	5000 tex	0.40 - 1.00 mm Ø
8000 cN	PA: 1.00 mm Ø	8000 tex	0.50 - 1.10 mm Ø
10 daN	PA: 1.00 mm Ø	10000 tex	0.70 - 1.20 mm Ø
20 daN	PA: 1.50 mm Ø	20000 tex	1.20 - 1.70 mm Ø
30 daN	PA: 1.50 mm Ø	20000 tex	1.50 - 2.00 mm Ø
50 daN	Steel rope:	30000 tex	1.50 - 2.50 mm Ø
50 daN	1.50 mm Ø (7x7x0.20)		

\* Tension measured in N (Newton):

1 cN = 1.02 g = 0.01 N; 1 daN = 1.02 kg = 10 N;

\*\* Calibration with standard materials – such as polyamide monofilament (PA) – according to the SCHMIDT factory procedure has been proved to provide the best results for 95% of all industrial applications.

**Note:** We recommend selecting the tension range twice the tension you intend to measure. This has the advantage that you can measure higher than expected values. It also facilitates reading the measured tension on analog scales.

- **If your material to be measured differs in kind and diameter:**

Please contact us for assistance to determine the right tension range and model. For this purpose a material sample of 5 m should be supplied.

**A wide variety of roller types are offered depending on the material to be measured:**

unsymmetrical cross sections



flexible, with small diameters



sensitive materials



flexible, with large diameters



tapes and bands



### 3. Select the guide rollers according to the following criteria:

- Roller shape V-grooved or with asymmetrical groove ...
- Roller shape U-grooved with radius or cylindrical ...
- Roller material (hardcoated aluminium, plastic, steel, etc.) ...
- Max. line speed of the measured material ...

→ see page E →

### 4. Required accessories:

- Adjustable damping – Special lever – Memory pointer

### 5. Special custom-made designs:

on request

- Special tension ranges
- Customized measuring head widths for applications with limited access space
- Customized distance between the two outer rollers to minimize material deflection
- Calibration for material path other than vertical
- Calibration to different units, such as g or kg

### 6. Calibration using customer-supplied material:

This is recommended when the material to be measured differs significantly from the SCHMIDT calibration material in diameter, rigidity or shape etc. For this purpose a material sample of about 5 m should be supplied.

### 7. Inspection Certificate and Calibration Reports:

These Quality Certificates are optionally available and are recommended especially for ISO 9000 certified companies.

**If you need assistance ...** Should you need any help in selecting your tension meter, please contact us directly, or the service department of your machinery supplier. In any case, please furnish the following information:

- Description of application and machinery
- Kind of tension meter
- Description of the material to be measured (Ø, type, characteristics, etc.)
- Line speed of the material
- Recommended or estimated tension
- Maximum measuring head width or available access space
- If necessary, submit a material sample of about 5 m



## Z SERIES

10 Tension ranges  
from 1 - 5 cN to 20 - 300 cN

Economical low tension measuring instruments  
for checking fibers, yarns and fine wires

### Special features:

- + Light weight
- + Large, easy to read scale (54 mm Ø)
- + Filament guide and roller shifting mechanism ensure easy acquisition of the running material

### Standard features:

- Everything in operator's view:
  - the guide rollers
  - the measured material
  - the readings
- Ball-bearing mounted, V-grooved guide rollers
- Each instrument is individually calibrated for highest accuracy
- Housing made of high-strength plastic
- Inspection Certificate with Calibration Report optionally available

**Slim filament guide with small guide rollers – ideal for limited access space**

**With bigger rollers for universal use**



Model ZF2-12  
Actual size

Model ZD2-100  
Actual size

**1<sup>st</sup>** IN TENSION  
METERS  
WORLDWIDE®

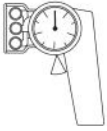


ZF2-5

ZF2-10

ZF2-12





## Model ZF2

Most popular tension meter in the textile industry with small rollers!

### Available Models

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration Material**
<b>ZF2-5</b>	1-5	43	Filament: 25 tex
<b>ZF2-10</b>	1-10	43	Filament: 25 tex
<b>ZF2-12</b>	1-12	43	Filament: 25 tex
<b>ZF2-20</b>	2-20	43	Filament: 25 tex
<b>ZF2-30</b>	3-30	43	PA: 0.12 mm Ø
<b>ZF2-50</b>	5-50	43	PA: 0.12 mm Ø
<b>ZF2-100</b>	10-100	43	PA: 0.12 mm Ø

Other tension ranges available on request. Other units of measure available, such as g.  
\* Width of filament guide  
\*\* Suitable for 95 % of applications (see also chart on page 11)  
PA = Polyamide Monofilament

### Guide Rollers

V-grooved	Line Speed V <sub>max</sub> ... m/min	Roller Material
<b>Standard</b>	900	Hard-coated aluminium
<b>Code K</b>	2000	Hard-coated aluminium
<b>Code T</b>	450	Plastic (POM) black
<b>Code W</b>	450	Nickel-plated steel

→ see page E →

### Specifications

#### ZF2 Series

Calibration:	According to SCHMIDT factory procedure
Accuracy:	±1 % full scale or ±1 graduation on scale
Scale diameter:	54 mm
Temperature range:	10-45 °C
Air humidity:	85 % RH, max.
Housing material:	Plastic (POM)
Housing dimensions:	157 x 85 x 32 mm (L x W x H)
Weight, net (gross):	approx. 200 g (600 g)

Special calibration using customer supplied samples is available:  
Please supply a sample of at least 5 m in length.

## Model ZD2

Universal tension meter for a variety of applications in the textile and wire industries

### Available Models

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration Material**
<b>ZD2-30</b>	3-30	63	PA: 0.12 mm Ø
<b>ZD2-50</b>	5-50	63	PA: 0.12 mm Ø
<b>ZD2-100</b>	10-100	63	PA: 0.12 mm Ø
<b>ZD2-150</b>	20-150	63	PA: 0.12 mm Ø
<b>ZD2-200</b>	20-200	63	PA: 0.12 mm Ø
<b>ZD2-300</b>	20-300	63	PA: 0.20 mm Ø

Other tension ranges available on request. Other units of measure available, such as g.  
\* Width of filament guide  
\*\* Suitable for 95 % of applications (see also chart on page 11)  
PA = Polyamide Monofilament

### Guide Rollers

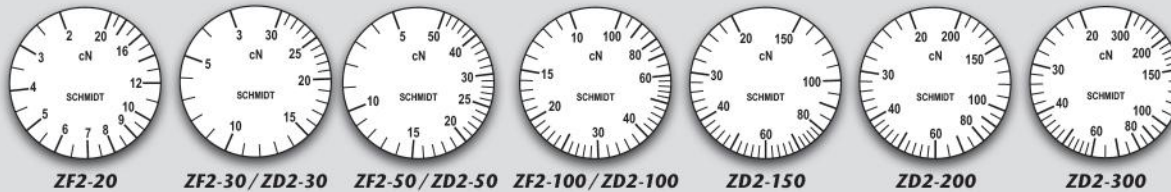
V-grooved	Line Speed V <sub>max</sub> ... m/min	Roller Material
<b>Standard</b>	2000	Hard-coated aluminium
<b>Code K</b>	3500	Hard-coated aluminium
<b>Code H</b>	5000	Plasma-coated aluminium (for Model ZD2-100 and higher ranges)
<b>Code T</b>	1000	Plastic (POM) black
<b>Code W</b>	1000	Nickel-plated steel
<b>Code ST</b>	1000	Hardened steel
<b>Code CE2</b>	1000	Aluminium ceramic-coated

→ see page E →

### Specifications

#### ZD2 Series

Calibration:	According to SCHMIDT factory procedure
Accuracy:	±1 % full scale or ±1 graduation on scale
Scale diameter:	54 mm
Temperature range:	10-45 °C
Air humidity:	85 % RH, max.
Housing material:	Plastic (POM)
Housing dimensions:	157 x 85 x 32 mm (L x W x H)
Weight, net (gross):	approx. 220 g (620 g)



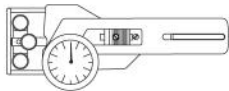
SCHMIDT scales are manufactured according to the most stringent quality requirements. Printed scales are not used. Instead, each scale is individually marked for the instrument involved. This ensures highest quality. Our special procedure makes it possible to provide tension meters fine tuned to a specific tension range, or calibrated to custom supplied material, or units of measure such as g.

To place an order  
please indicate the complete model number, e.g.:

Model with tension range  
Code for guide rollers  
(if not standard)  
Complete Order No.

**ZD2-100** + **K** = **ZD2-100-K**

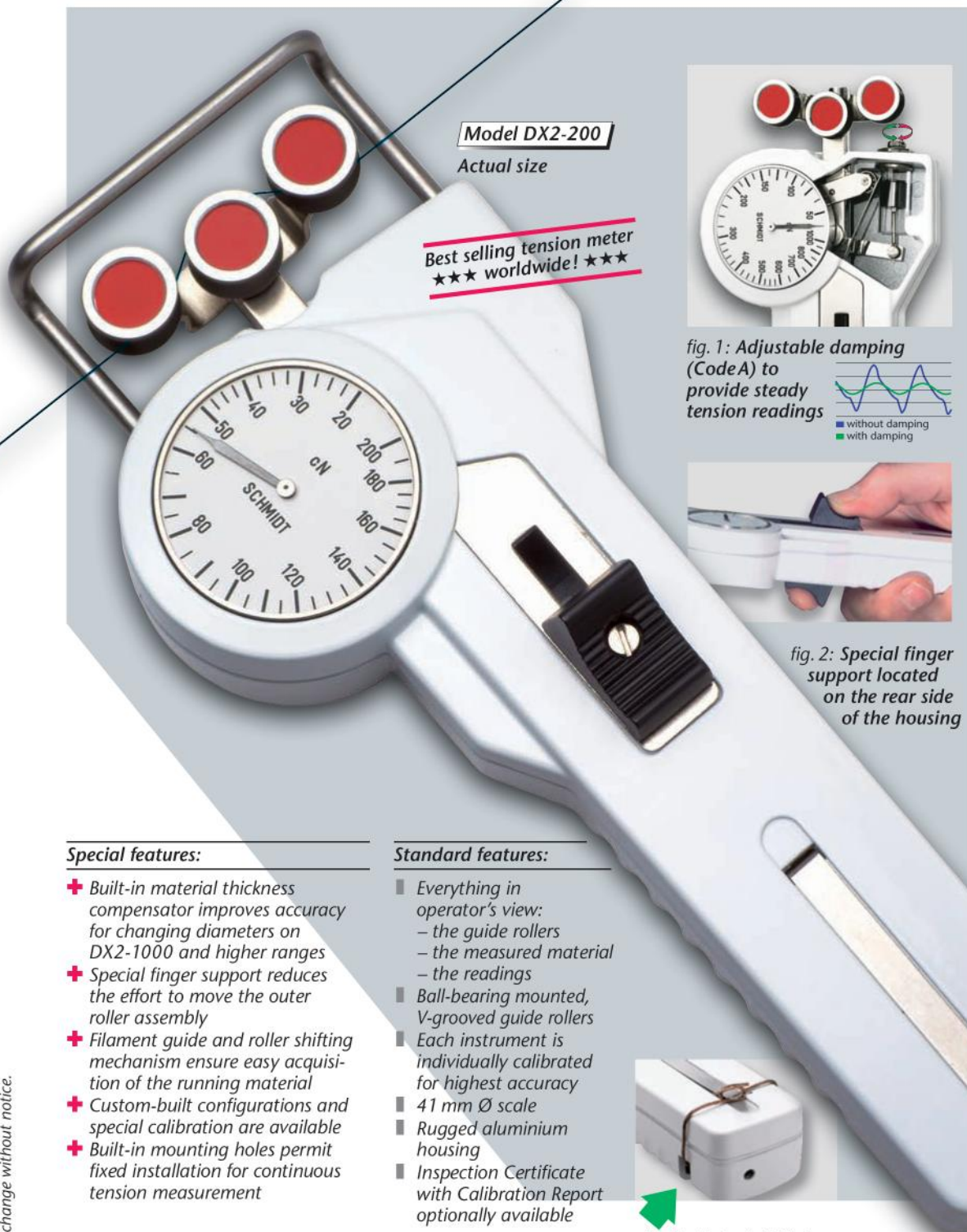




# DX SERIES

12 Tension ranges  
from 10-50cN to 5-20daN

Universal tension meters  
for most industrial applications



**Model DX2-200**

Actual size

Best selling tension meter  
★★★ worldwide! ★★★

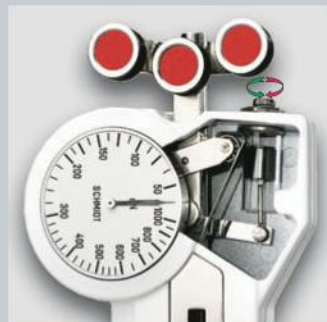


fig. 1: Adjustable damping (Code A) to provide steady tension readings

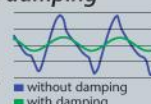


fig. 2: Special finger support located on the rear side of the housing

**Special features:**

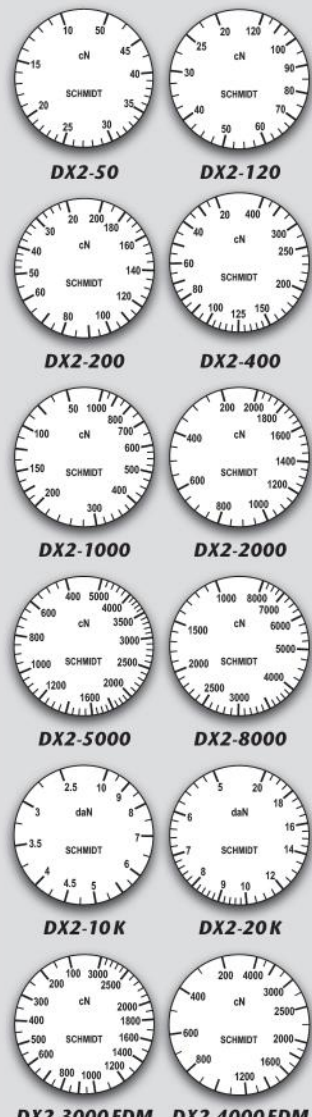
- + Built-in material thickness compensator improves accuracy for changing diameters on DX2-1000 and higher ranges
- + Special finger support reduces the effort to move the outer roller assembly
- + Filament guide and roller shifting mechanism ensure easy acquisition of the running material
- + Custom-built configurations and special calibration are available
- + Built-in mounting holes permit fixed installation for continuous tension measurement

**Standard features:**

- Everything in operator's view:
  - the guide rollers
  - the measured material
  - the readings
- Ball-bearing mounted, V-grooved guide rollers
- Each instrument is individually calibrated for highest accuracy
- 41 mm Ø scale
- Rugged aluminium housing
- Inspection Certificate with Calibration Report optionally available



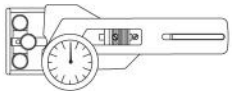
fig. 3: Material thickness compensator with material sample inserted



SCHMIDT scales are manufactured according to the most stringent quality requirements. Printed scales are not used. Instead, each scale is individually marked for the instrument involved. This ensures highest quality. Our special procedure makes it possible to provide tension meters fine tuned to a specific tension range, or calibrated to customer supplied material, or units of measure such as g or kg.

Subject to change without notice.





# Model DX2

Please ask for additional informations!

**Available Models**

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration Material**	Material thickness com- pensator included
<b>DX2-50</b>	10 - 50	66	PA: 0.12 mm Ø	
<b>DX2-120</b>	20 - 120	66	PA: 0.12 mm Ø	
<b>DX2-200</b>	20 - 200	66	PA: 0.12 mm Ø	
<b>DX2-400</b>	20 - 400	66	PA: 0.20 mm Ø	
<b>DX2-1000</b>	50 - 1000	66	PA: 0.30 mm Ø	✓
<b>DX2-2000</b>	200 - 2000	116	PA: 0.50 mm Ø	✓
<b>DX2-5000</b>	400 - 5000	116	PA: 0.80 mm Ø	✓
<b>DX2-8000</b>	1000 - 8000	116	PA: 1.00 mm Ø	✓
<b>DX2-10K</b>	2.5 - 10 daN	116	PA: 1.00 mm Ø	✓
<b>DX2-20K-L</b>	5 - 20 daN	216	PA: 1.50 mm Ø	✓

Other tension ranges and measuring head widths available on request.  
Other units of measure available – g or kg.

\* Depending on model, either width of filament guide or outer distance between outside guide rollers

\*\* Suitable for 95 % of applications (see also chart on page 11)

PA = Polyamide Monofilament

**Guide Rollers**

	Line Speed V <sub>max</sub> ... m/min	Roller Material
<b>V-grooved</b>		
<b>Standard</b>	2000	Hard-coated aluminium
<b>Code K</b>	3500	Hard-coated aluminium
<b>Code H</b>	5000	Plasma-coated aluminium (for Model DX2-120 and higher ranges)
<b>Code T</b>	1000	Plastic (POM) black
<b>Code W</b>	1000	Nickel-plated steel
<b>Code ST</b>	1000	Hardened steel
<b>Code B</b>	1000	Tempered steel for tire cord
<b>Code CE 2</b>	1000	Aluminium ceramic-coated
<b>Code ASY</b>	1000	Hard-coated aluminium*
<b>Code ASYB</b> asymmetrical groove	1000	tempered steel for tire cord* (for Model DX2-120 and higher ranges)
		*Gauge without filament guide
<b>U-grooved</b>		
<b>Code U</b>	2000	Hard-coated aluminium

→ see page E →

**Optional Accessories**

<b>Code A</b>	<b>Air damping</b> (Model DX2-120 to DX2-5000 only)
<b>Code L</b>	<b>Special lever</b> (standard for Model DX2-20K) – recommended for Model DX2-10K –
<b>Code M</b>	<b>Memory pointer</b> (DX2-120 and higher ranges)
<b>Code EDM</b>	<b>Version for electro discharging machines</b> Model DX2-2000-EDM: 50 - 2000 cN Model DX2-3000-EDM: 100 - 3000 cN Model DX2-4000-EDM: 200 - 4000 cN



**Model DX2-2000-EDM**

Wire EDM version  
(Code EDM)

**1<sup>st</sup>** IN TENSION  
METERS  
WORLDWIDE®

**Model DX2-10K-L**

with special lever (Code L) for  
easy use on higher tension ranges

**Specifications**

	<b>DX Series</b>
Calibration:	According to SCHMIDT factory procedure
Accuracy:	±1 % full scale or ±1 graduation on scale
Scale diameter:	41 mm
Temperature range:	10 - 45 °C
Air humidity:	85 % RH, max.
Housing material:	Die-cast aluminium
Housing dimensions:	188 x 85 x 45 mm (LxWxH)
Weight, net (gross):	up to DX2-10K approx. 470 g (1000 g) DX2-20K-L approx. 580 g (2000 g)

Special calibration using customer supplied samples is available: Please supply a sample of at least 5 m in length.

Model with tension range

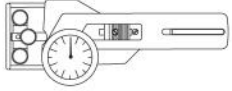
Code for guide rollers  
(if not standard)

Code for accessory

Complete Order No.

To place an order  
please indicate the complete model number, e.g.:

**DX2-400** + **H** + **A-M** = **DX2-400-H-A-M**



**Special purpose models feature small measuring heads, where access space is limited or where filaments run close together**

These tension meters are recommended where the standard Model DX2 cannot be used.

**Special features:**

- + Turned-up outer finger edges guide the running filament into the roller grooves
- + Small, ball-bearing mounted, V-grooved guide rollers (Models DXE and DXV)
- + Model DXP features ceramic pins for applications with high line speeds or texturizing machines
- + Special calibration using customer supplied samples is available (Models DXE and DXV only)

■ Apart from that the instruments relate to model DX2;  
**Note:** The below models do not include a material thickness compensator

**1<sup>st</sup> IN TENSION METERS WORLDWIDE®**

**Guide Rollers**

→ see page E →

**Models DXE, DXV**

V-grooved	Line Speed <i>v<sub>max.</sub> ... m/min</i>	Roller Material
Standard	900	Hard-coated aluminium
Code K	2000	Hard-coated aluminium
Code T	450	Plastic (POM) black
Code W	450	Nickel-plated steel

**Guide Pins**

→ see page E →

**Model DXP**

V-grooved	Line Speed <i>v<sub>max.</sub> ... m/min</i>	Pin Material
Standard	6000	Aluminium-oxide ceramic 5.2 mm Ø

**Optional Accessories**

**Models DXE, DXV, DXP**

Code A	Air damping (Model -120 and higher ranges)
Code M	Memory pointer (Model -120 and higher ranges)

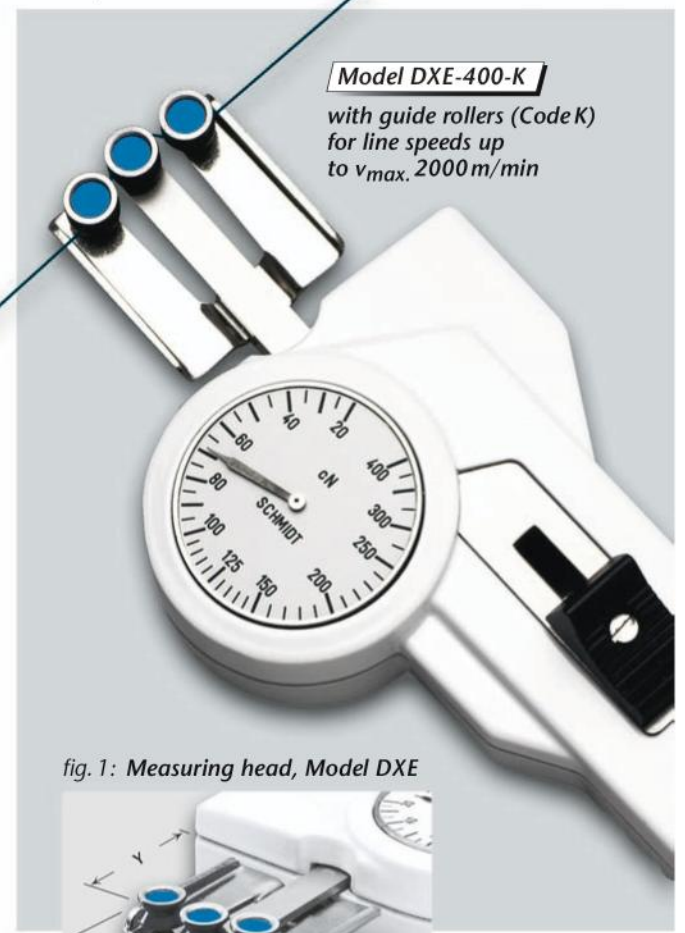
**Specifications**

same as Model DX2 (see page A4)

Special calibration using customer supplied samples is available:  
Please supply a sample of at least 5 m in length.

**Model DXE**

Special tension meter for limited access space



**Model DXE-400-K**

with guide rollers (Code K) for line speeds up to *v<sub>max.</sub>* 2000 m/min

fig. 1: Measuring head, Model DXE



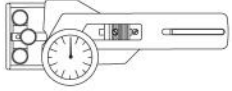
**Available Models**

MODEL	Tension Ranges cN	Measuring Head Width X* approx. mm	Measuring Head Length Y approx. mm	SCHMIDT Calibration Material**
<b>DXE-50</b>	10 - 50	38	47	PA: 0.12 mm Ø
<b>DXE-120</b>	20 - 120	38	47	PA: 0.12 mm Ø
<b>DXE-200</b>	20 - 200	38	47	PA: 0.12 mm Ø
<b>DXE-400</b>	20 - 400	38	47	PA: 0.20 mm Ø
<b>DXE-1000</b>	50 - 1000	36	47	PA: 0.30 mm Ø
<b>DXE-2000</b>	200 - 2000	36	47	PA: 0.50 mm Ø

Other tension ranges available on request. Other units of measure available, such as g.  
\* Width of bracket assembly  
\*\* Suitable for 95% of applications (see also chart on page 11)  
PA = Polyamide Monofilament

Subject to change without notice.





## Model DXV

This special design provides easier reading when the standard design makes dial reading difficult

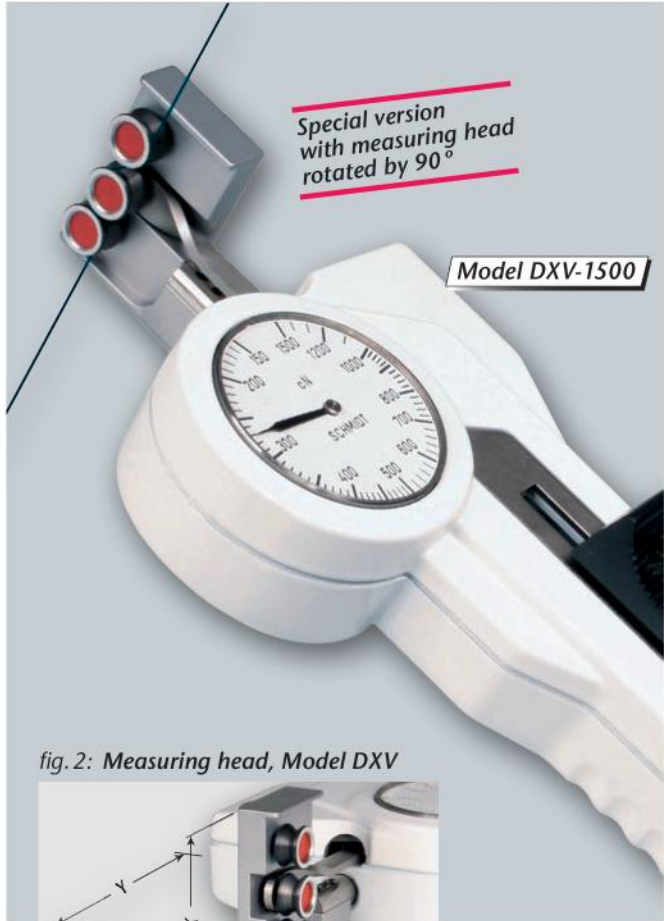
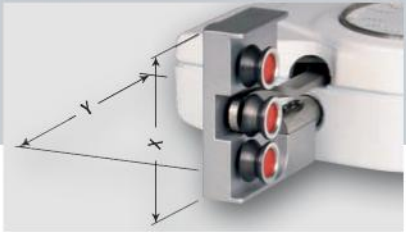


fig. 2: Measuring head, Model DXV



## Model DXP

Non-rotating ceramic pins permit line speeds up to  $v_{max}$ . 6000 m/min

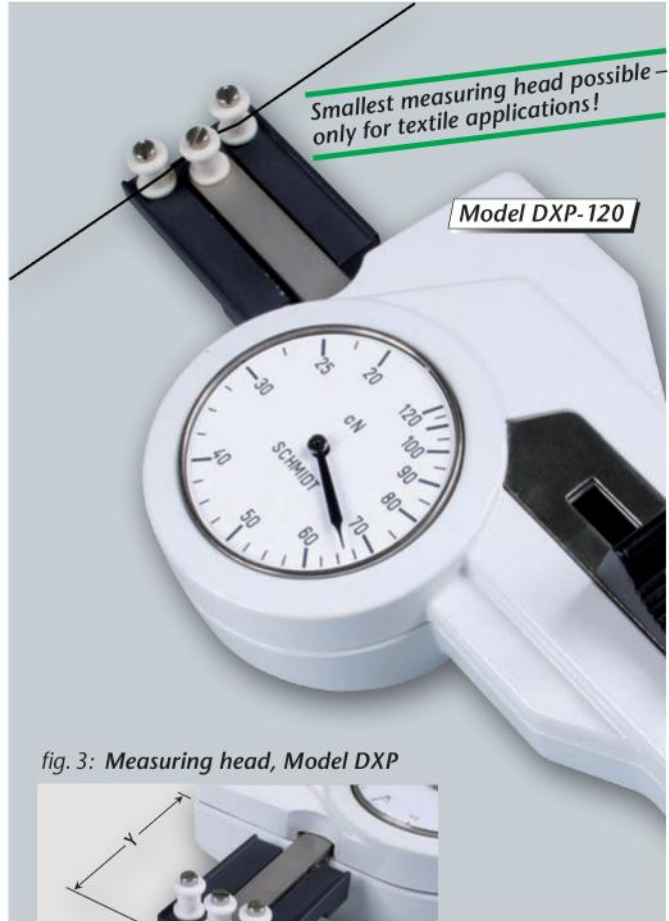


fig. 3: Measuring head, Model DXP



**Available Models**

MODEL	Tension Ranges cN	Measuring Head Width X* approx. mm	Measuring Head Length Y approx. mm	SCHMIDT Calibration Material**
<b>DXV-50</b>	10-50	40	42	PA: 0.12 mm Ø
<b>DXV-120</b>	20-120	40	42	PA: 0.12 mm Ø
<b>DXV-200</b>	20-200	40	42	PA: 0.12 mm Ø
<b>DXV-400</b>	20-400	40	42	PA: 0.20 mm Ø
<b>DXV-1000</b>	50-1000	40	42	PA: 0.30 mm Ø
<b>DXV-1500</b>	150-1500	40	42	PA: 0.30 mm Ø
<b>DXV-2000</b>	200-2000	40	42	PA: 0.50 mm Ø

Other tension ranges available on request. Other units of measure available, such as g.  
\* Width of bracket assembly  
\*\* Suitable for 95% of applications (see also chart on page 11)  
PA = Polyamide Monofilament

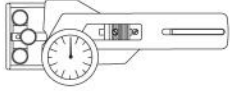
**Available Models**

MODEL	Tension Ranges cN	Measuring Head Width X* approx. mm	Measuring Head Length Y approx. mm	SCHMIDT Calibration Material**
<b>DXP-50</b>	10-50	27	44	PA: 0.12 mm Ø
<b>DXP-120</b>	20-120	27	44	PA: 0.12 mm Ø
<b>DXP-200</b>	20-200	27	44	PA: 0.12 mm Ø

Other tension ranges available on request. Other units of measure available, such as g.  
\* Width of bracket assembly  
\*\* Suitable for 95% of applications (see also chart on page 11)  
PA = Polyamide Monofilament

To place an order please indicate the complete model number, e.g.:

Model with tension range  
Code for guide rollers (if not standard)  
Code for accessory  
Complete Order No.  
**DXE-400** + **K** + **A-M** = **DXE-400-K-A-M**



Special purpose tension meter features large rollers and a wide roller spacing to minimize the bending of the material

**Special features:**

- + Large, V-grooved guide rollers, ball-bearing mounted  
DXF: 32 mm Ø, DXL: 29.5 mm Ø
- + Large bending radius assures gentle handling of the material being measured
- Apart from that the instruments relate to model DX2;  
Note: These models do not have a built-in material thickness compensator

**Model DXF, DXL**

**Available Models**

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration Material**
<b>DXF-120</b>	20 - 120	140	PA: 0.12 mm Ø
<b>DXF-200</b>	20 - 200	140	PA: 0.12 mm Ø
<b>DXF-400</b>	20 - 400	140	PA: 0.20 mm Ø
<b>DXF-1000</b>	50 - 1000	140	PA: 0.30 mm Ø
<b>DXL-2000</b>	200 - 2000	235	Buffer tube Ø 2.5 mm
<b>DXL-5000</b>	400 - 5000	235	Buffer tube Ø 2.5 mm
<b>DXL-10K</b>	2.5 - 10 daN	288	Buffer tube Ø 2.5 mm

Other tension ranges available on request. Other units of measure available, such as g.

\* Outer distance between outside guide rollers

\*\* Suitable for 95 % of applications (see also chart on page 11)

PA = Polyamide Monofilament

**Guide Rollers**

**Model DXF**

**V-grooved**

	Line Speed v <sub>max</sub> ... m/min	Roller Material
<b>Standard</b>	4000	Hard-coated aluminium
<b>Code T</b>	4000	Plastic (PVC) red (Same dimensions as standard roller)

**Model DXL**

**V-grooved**

<b>Standard</b>	4000	Hardened steel (max. Ø 5 mm)
-----------------	------	------------------------------

**U-grooved**

<b>Code R1</b>	4000	Hard chrome-plated steel (radius R5)
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**flat**

<b>Code B6</b>	2000	Hardened steel, width 6 mm
<b>Code B10</b>	2000	Hardened steel, width 10 mm

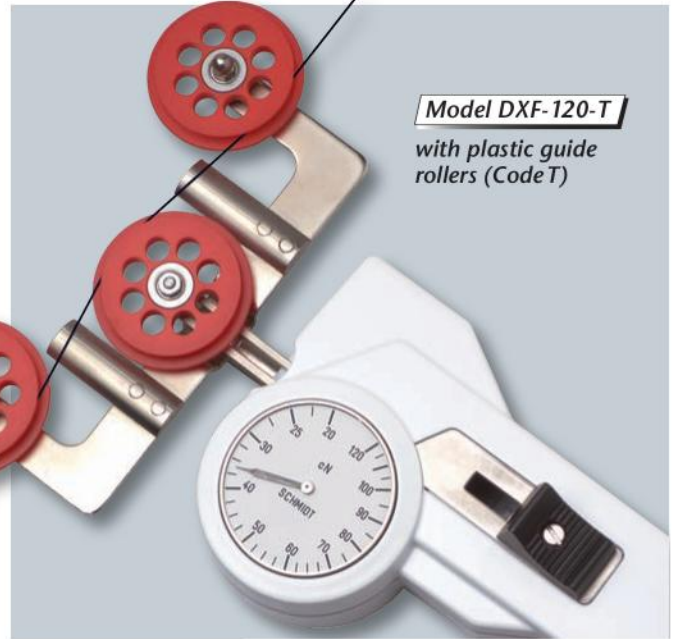
**Optional Accessories**

<b>Code A</b>	Air damping (available for Models -400 to -5000)
<b>Code M</b>	Memory pointer

**Specifications** same as Model DX2 (see page A4)

**Model DXF**

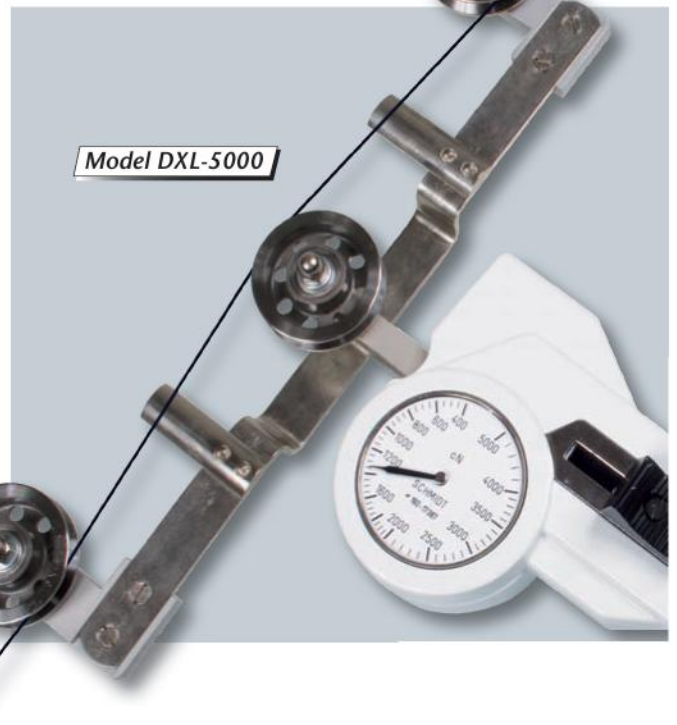
For fragile filaments such as optical fibers, glass fibers, single carbon fibers etc., up to max. 1.5 mm Ø



**Model DXF-120-T**  
with plastic guide rollers (Code T)

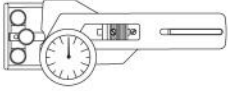
**Model DXL**

For fiber optics, buffer tubes, fibers, cables, ropes, up to max. 8 mm Ø



**Model DXL-5000**





## Tension meter for measuring warp threads on weaving machines

Model DXK measures the warp thread tension while the weaving machine is not running. We recommend always measuring the same number of ends, such as 5 or 10 ends (repeat of pattern) or only a single end at a time. During measurement make sure that the ends are not pulled or pressed out of their alignment.

### Special features:

- + Width of the sensing pin 10 mm
- + Reference frame (15 x 17 cm) assures a stable, perpendicular position
- Apart from that the instrument relates to model DX2;  
**Note:** This model does not have a built-in material thickness compensator.

### Available Models

MODEL	Tension Ranges cN
<b>DXK-300</b>	20 - 300
<b>DXK-1000</b>	100 - 1000
<b>DXK-2000</b>	200 - 2000

SCHMIDT calibration material textile ribbon. Other tension ranges available on request. Other units of measure available, such as g.

### Optional Accessories

**Code M** Memory pointer

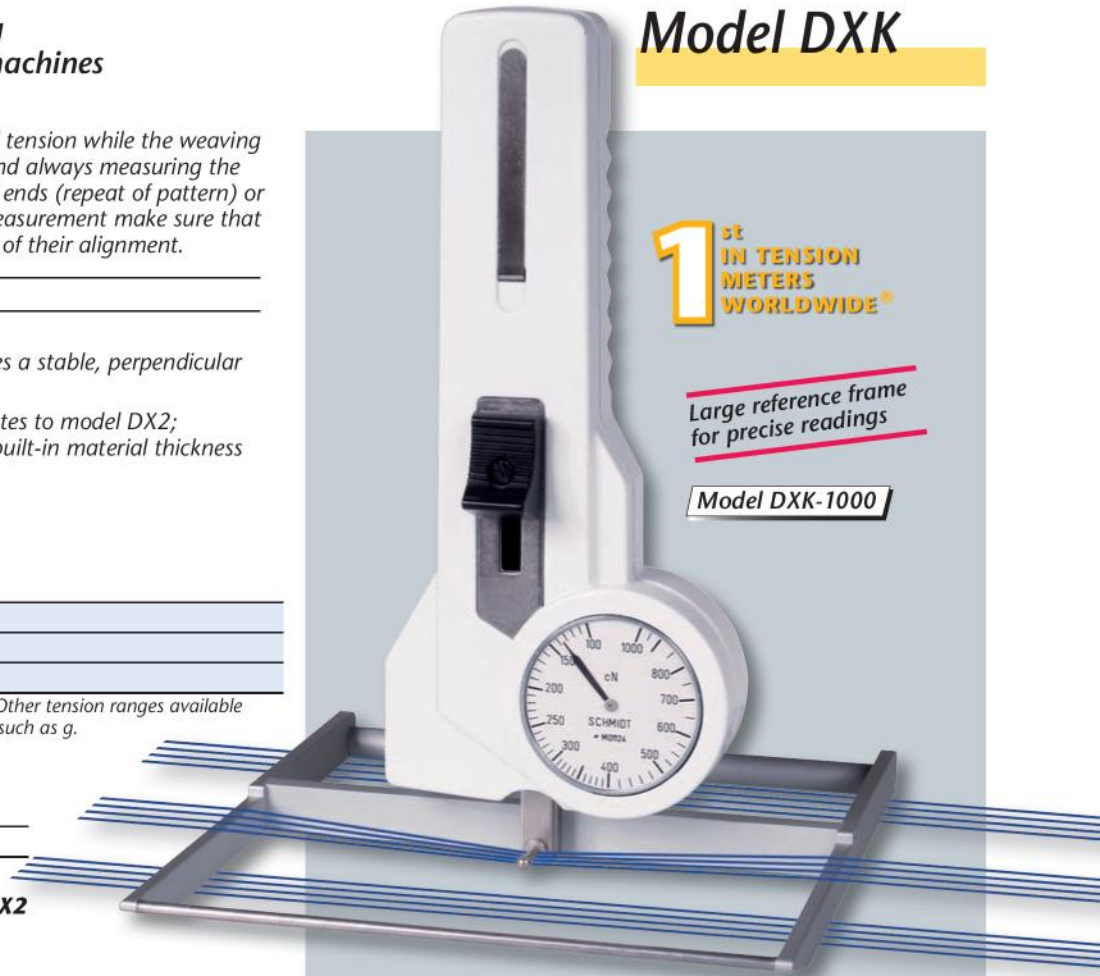
**Specifications** same as Model DX2  
(see page A 4)

## Model DXK

**1<sup>st</sup>**  
IN TENSION  
METERS  
WORLDWIDE®

Large reference frame  
for precise readings

Model DXK-1000



## Screen Printing Tension Meter

Synthetic mesh always loses tension in time. Correct mesh tension is one of the most important conditions for accurate, reproduceable and high quality screen printing.

### Special features:

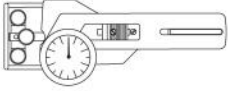
- + To be used for synthetic and steel meshes
- + Warpwise or weftwise measuring is possible
- + 2 adjustable markers to set limits (MIN, MAX)
- + Measuring range 6 - 50 N/cm
- + Protected precision dial gauge
- + Depth of indentation max. 1 mm
- + Measuring force 2.1 - 3.0 N
- + According DIN EN 16611
- + Inspection Certificate with Calibration Report optionally available



## Model FT

Model FT





**Special purpose tension meter for measuring all kinds of tapes and bands, such as textile ribbons, films, foils, fiber bunches etc.**

**Special features:**

- + Dual-flanged outer guide rollers with various widths, from 7 mm to 100 mm (single-flanged rollers optional)
- + Special calibration is available
- Apart from that the instrument relates to model DX2;  
**Note:** This model does not include a filament guide and material thickness compensator

**When selecting the instrument for your specific application, please keep in mind that:**

1. Rollers of different widths are not interchangeable by the user
2. The roller width should correspond with the width of the material to be measured. Otherwise incorrect measuring results may occur and the instrument may be damaged

**SCHMIDT has the solution to any tension measuring problem! Please contact us to discuss your application requirements.**

To assist you in selecting the right tension meter for your specific application, please furnish:

- Kind and dimensions of the material to be measured
- Expected tension range
- Material sample of about 5 m

**1<sup>st</sup> IN TENSION METERS WORLDWIDE®**

**Models DXB, DXR, DXT**

**Guide Rollers**

Line Speed  
 $v_{max.} \dots m/min$   
Roller Material

→ see page E →

<b>Standard</b>	1000 Hard-coated aluminium (Exception: 7 mm rollers are made of nickel-plated steel)
-----------------	---

Other roller materials (nickel-plated steel or plastic), as well as special coatings (anti-adhesive or carbon fibres - NAV optimized) are available on request.

**Optional Accessories**

<b>Code A</b>	<b>Air damping</b> (available for Models -400 to -5000) – not available for Model DXR –
<b>Code L</b>	<b>Special lever</b> (Standard for Models -20K and higher) – recommended for -10K Models –
<b>Code M</b>	<b>Memory pointer</b> – not available for DXB-50 and DXT-50 –

**Specifications**

**same as Model DX2** (see page A4)

**Special calibration using customer supplied samples is available:**  
Please supply a sample of at least 5 m in length.

**Model DXB**

**Cylindrical rollers pointing toward the operator**



**Model DXB-5000-30**  
Version with 30 mm tape rollers

**Available Models**

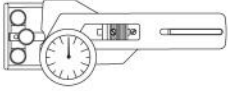
MODEL	Tension Ranges cN	Measuring Head Width **	
		mm	Roller Widths mm
<b>DXB-50</b>	10 - 50	55	7
<b>DXB-120</b>	20 - 120	55	7, 10, 15, 20, 30
<b>DXB-200</b>	20 - 200	55	7, 10, 15, 20, 30
<b>DXB-400</b>	20 - 400	55	7, 10, 15, 20, 30
<b>DXB-1000</b>	100 - 1000	55	7, 10, 15, 20, 30, 36, 41, 50
<b>DXB-2000</b>	200 - 2000	117	7, 10, 15, 20, 30, 36, 41, 50
<b>DXB-5000</b>	400 - 5000	117	7, 10, 15, 20, 30, 36, 41, 50
<b>DXB-10K</b>	2.5 - 10 daN	117	7, 10, 15, 20, 30, 36, 41
<b>DXB-20K-L</b>	5 - 20 daN	167	7, 10, 15, 20, 30

Other tension ranges, measuring head widths, and material path calibrations available on request. Other units of measure available – g or kg.

\* SCHMIDT calibration material textile ribbon or film, depending on tension range and roller width

\*\* Outer distance between outside guide rollers





## Model DXR

With heavy-duty bracket and special roller support



**Model DXR-50 K-100-L**

Version with 100 mm tape rollers and special lever (Code L) for easy use at higher ranges

## Model DXT

Cylindrical rollers pointing away from the operator



**Model DXT-1000-20**

Version with 20 mm tape rollers

**Available Models**

MODEL	Tension Ranges cN	Measuring Head Width** mm	Roller Widths mm
<b>DXR-2000</b>	200-2000	125	50, 100
<b>DXR-5000</b>	400-5000	125	50, 100
<b>DXR-10K-L</b>	2.5-10 daN	125	50, 100
<b>DXR-20K-L</b>	5-20 daN	200	50, 100
<b>DXR-30K-L</b>	5-30 daN	200	50, 100
<b>DXR-50K-L</b>	5-50 daN	200	50, 100

Other tension ranges and other measuring head widths available on request.  
Other units of measure available – g or kg.

\* SCHMIDT calibration material textile ribbon or film, depending on tension range and roller width

\*\* Outer distance between outside guide rollers

**Note: Standard equipment of Models DXR-10K to DXR-50K includes special lever (Code L).**

**Available Models**

MODEL	Tension Ranges cN	Measuring Head Width** mm	Roller Widths mm
<b>DXT-50</b>	10-50	57	7
<b>DXT-120</b>	20-120	57	7, 10, 15, 20, 30
<b>DXT-200</b>	20-200	57	7, 10, 15, 20, 30
<b>DXT-400</b>	20-400	57	7, 10, 15, 20, 30
<b>DXT-1000</b>	100-1000	57	7, 10, 15, 20, 30, 36, 41, 50
<b>DXT-2000</b>	200-2000	117	7, 10, 15, 20, 30, 36, 41, 50
<b>DXT-5000</b>	400-5000	117	7, 10, 15, 20, 30, 36, 41, 50
<b>DXT-10K</b>	2.5-10 daN	117	7, 10, 15, 20, 30
<b>DXT-20K-L</b>	5-20 daN	117	7, 10, 15, 20

Other tension ranges, measuring head widths, and material path calibrations available on request. Other units of measure available – g or kg.

\* SCHMIDT calibration horizontal lying; material textile ribbon or film, depending on tension range and roller width

\*\* Outer distance between outside guide rollers

Model with tension range

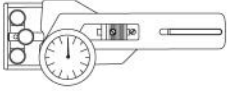
Roller width in mm

Code for accessory

Complete Order No.

To place an order please indicate the complete model number, e.g.:

**DXB-1000** + **20** + **A** = **DXB-1000-20-A**



### Tension meter for measurement at sewing machines

Besides strength and the kind of stitch the tension of the upper and lower thread is important for the solidity and the image of the seam. Tension determines the stitching length.

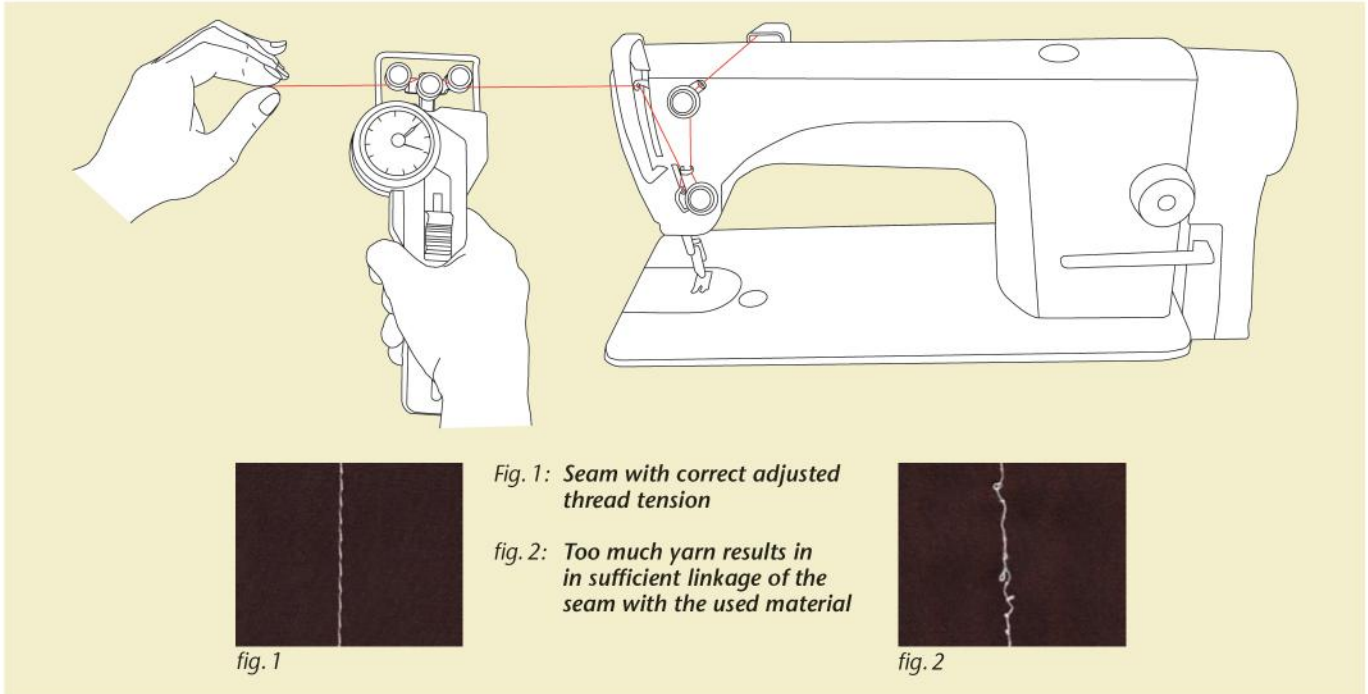


fig. 1

Fig. 1: Seam with correct adjusted thread tension



fig. 2

fig. 2: Too much yarn results in insufficient linkage of the seam with the used material

## DX SERIES

For measuring the upper and under thread of non-operating machines DX2 series is recommended. The tension meter is used after the yarn break and the thread unwinded by hand.

### Most used model:

DX2-400, DX2-1000 and DX2-2000; these tension meters are often equipped with a memory pointer code M, to read the measuring value after finishing the measurement.

Further tension meters for measuring the thread tension at sewing machines



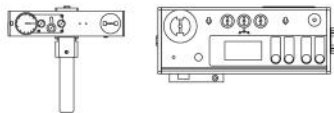
Tension meter DX2 with memory pointer Code M



### Recommended Models

<b>ZF2</b>	see page A 1
<b>DT</b>	see page C 5
<b>ET</b>	see page C 13
<b>Q</b>	see page B 1
<b>TS</b>	see page D 2





**Tension Meter for measuring the tension of sewing machines and yarn breaks**

These models can be used for measuring the upper and lower thread. These unique instruments exist out of a tension meter (with analog or digital display) with an integrated motorized take-up fixture with constant speed of thread. Also yarn breaks and bobbin creels can be adjusted under constant conditions (speed of the thread).

**Mechanical tension meter with motorized take-up fixture**

**Model MKM**

3 Tension ranges from 10 - 50 cN to 50 - 400 cN



- Special features:**
- + Motorized take-up wheel for constant take-up speed (~ 8 m/min respectively ~ 15 m/min) for similar conditions
  - + Handle can be reversed for using the instrument comfortable in all positions

- Standard features:**
- Motor rechargeable battery operated
  - Ball-bearing mounted, V-grooved guide rollers
  - Weight, net (gross): approx. 650 g (1250 g)
  - Inspection Certificate with Calibration Report optionally available
  - Apart from that the instrument relates to model MK

Available Models	Tension Ranges cN	Take-up Speed m/min	SCHMIDT Calibration Material*
<b>MKM-50</b>	10 - 50	15	PA: 0.12 mm Ø
<b>MKM-100</b>	10 - 100	15	PA: 0.12 mm Ø
<b>MKM-400</b>	50 - 400	8	PA: 0.20 mm Ø

\* Suitable for 95 % of applications (see also chart on page 11)  
PA = Polyamide Monofilament

**Electronic tension meter with motorized take-up fixture**

**Model MST**

3 Tension ranges from 1 - 500 cN to 1 - 2000 cN



- Special features:**
- + Motorized take-up fixture to have constant speed of the thread ( $v = 8 \text{ m/min}$ )
  - + Storage of AVG, LAST, MIN, MAX, PEAK-MAX and PEAK-MIN values as well as statistical analysis (average value) during a user-selected period
  - + Special fixture to determine shuttle tension
  - + Section-cup base for positioning the unit on sewing machine table when tension is measured
  - + Connection to PC using Software »Tension Inspect 3« optional

- Standard features:**
- Battery or mains-operated (MST-2000 only mains-operated)
  - Zero setting by using the "Zero" button before measurement
  - Output signal (option): analog 0 - 2VDC  
digital RS 232
  - Weight, net (gross): approx. 780 g (2000 g)
  - Inspection Certificate with Calibration Report optionally available

Available Models	Tension Ranges cN	SCHMIDT Calibration Material*
<b>MST-500</b>	1 - 500	PA: 0.20 mm Ø
<b>MST-1000</b>	1 - 1000	PA: 0.30 mm Ø
<b>MST-2000</b>	1 - 2000	PA: 0.50 mm Ø

\* Suitable for 95 % of applications (see also chart on page 11)  
PA = Polyamide Monofilament



# DN SERIES

12 Tension ranges  
from 20 - 120 cN to 5 - 50 daN

Durable tension meters for a wide range of applications in the textile, fiber and wire industries



**1<sup>st</sup>** IN TENSION METERS WORLDWIDE®

For high tensions up to 50 daN – large, easy to read scale

**Model DN1-400**  
Actual size

**Special features:**

- + Large, easy to read scale (54 mm Ø)
- + Linearized scale provides a better reading
- + Shock-resistant movement
- + Built-in material thickness compensator improves accuracy for changing diameters on DN1-1000 and higher ranges
- + Filament guide and roller shifting mechanism ensure easy acquisition of the running material

**Standard features:**

- Everything in operator's view:
  - the guide rollers
  - the measured material
  - the readings
- Ball-bearing mounted, V-grooved guide rollers
- Each instrument is individually calibrated for highest accuracy
- Special calibration is available
- Rugged aluminium housing
- Inspection Certificate with Calibration Report optionally available

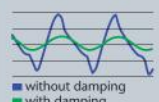
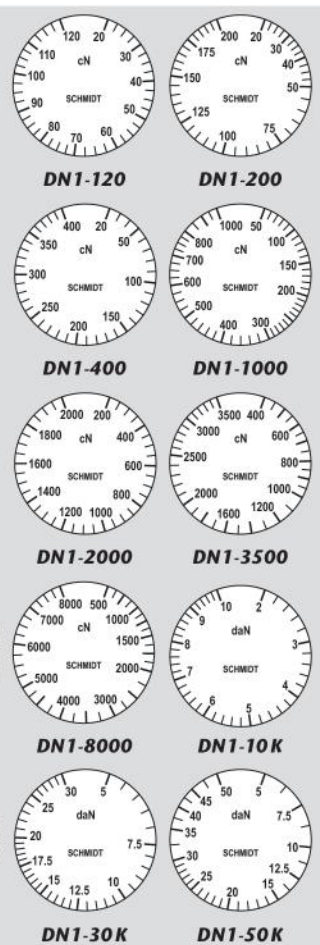


fig. 1: Adjustable damping (Code A) to provide steady tension readings



SCHMIDT scales are manufactured according to the most stringent quality requirements. Printed scales are not used. Instead, each scale is individually marked for the instrument involved. This ensures highest quality. Our special procedure makes it possible to provide tension meters fine tuned to a specific tension range, or calibrated to customer supplied material, or units of measure such as g or kg.



fig. 2: Material thickness compensator with material sample inserted

Subject to change without notice.





# Model DN1

### Available Models

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT- Calibration Material**	Material thickness com- pensator included
<b>DN1-120</b>	20-120	65	PA: 0.12 mm Ø	
<b>DN1-200</b>	20-200	65	PA: 0.12 mm Ø	
<b>DN1-400</b>	20-400	65	PA: 0.20 mm Ø	
<b>DN1-1000</b>	50-1000	65	PA: 0.30 mm Ø	✓
<b>DN1-2000</b>	200-2000	116	PA: 0.50 mm Ø	✓
<b>DN1-3500</b>	400-3500	116	PA: 0.80 mm Ø	✓
<b>DN1-5000</b>	400-5000	116	PA: 0.80 mm Ø	✓
<b>DN1-8000</b>	500-8000	116	PA: 1.00 mm Ø	✓
<b>DN1-10K</b>	2-10 daN	116	PA: 1.00 mm Ø	✓
<b>DN1-20K-L</b>	5-20 daN	216***	PA: 1.50 mm Ø	✓
<b>DN1-30K-L</b>	5-30 daN	265***	PA: 1.50 mm Ø	
<b>DN1-50K-L</b>	5-50 daN	265***	Steel rope: 1.50 mm Ø (7x7x0.20)	

Other tension ranges and measuring head widths available on request.  
Other units of measure available – g or kg.

\* Depending on model, either width of filament guide or outer distance between outside guide rollers

\*\* Suitable for 95% of applications (see also chart on page 11)  
PA = Polyamide Monofilament

\*\*\* Deviating measuring head width 285 mm with Code V1

### Guide Rollers

V-grooved	Line Speed v <sub>max.</sub> ... m/min	Roller Material
Standard	2000	Hard-coated aluminium
	1000	Model DN1-30 K and DN1-50 K
Code K	3500	Hard-coated aluminium
Code H	5000	Plasma-coated aluminium (not available for DN1-30 K and DN1-50 K)
Code T	1000	Plastic (POM) black
Code W	1000	Nickel-plated steel
Code ST	1000	Hardened steel
Code B	1000	Tempered steel for tire cord
Code CE2	1000	Aluminium ceramic-coated
Code ASY	1000	Hard-coated aluminium
Code ASYB	1000	Tempered steel for tire cord
Code V1	1000	Hard-coated aluminium* *only for DN1-20K up to DN1-50K
U-grooved		
Code U	2000	Hard-coated aluminium

→ see page E →

### Optional Accessories

Code A	Air damping (Models DN1-120 to DN1-5000 only)
Code L	Special lever (standard for DN1-20K and higher ranges) – recommended for DN1-10 K –

Special calibration using customer supplied samples is available:  
Please supply a sample of at least 5 m in length.

### Model DN1-50K-L-V1

with guide rollers (Code V1) for better and safer handling of higher tension and special lever for easy use at high ranges (Code L)

### Model DN1-2000-K

with special guide rollers for line speeds up to v<sub>max.</sub> 3500 m/min (Code K)

### Specifications

Specifications	DN Series
Calibration:	According to SCHMIDT factory procedure
Accuracy:	±1% full scale or ±1 graduation on scale
Scale diameter:	54 mm
Temperature range:	10 - 45 °C
Air humidity:	85% RH, max.
Housing material:	Die-cast aluminium
Housing dimensions:	220 x 74 x 42 mm (L x W x H)
Weight, net (gross): (approx.)	up to DN1-10 K approx. 700 g (1200 g) DN1-20 K-L and higher ranges 900 g (2200 g)

To place an order  
please indicate the complete model number, e.g.:

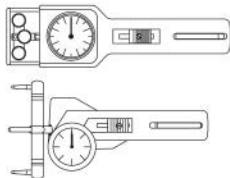
DN1-400 + ST + A = DN1-400-ST-A

Model with tension range

Code for guide rollers  
(if not standard)

Code for accessory

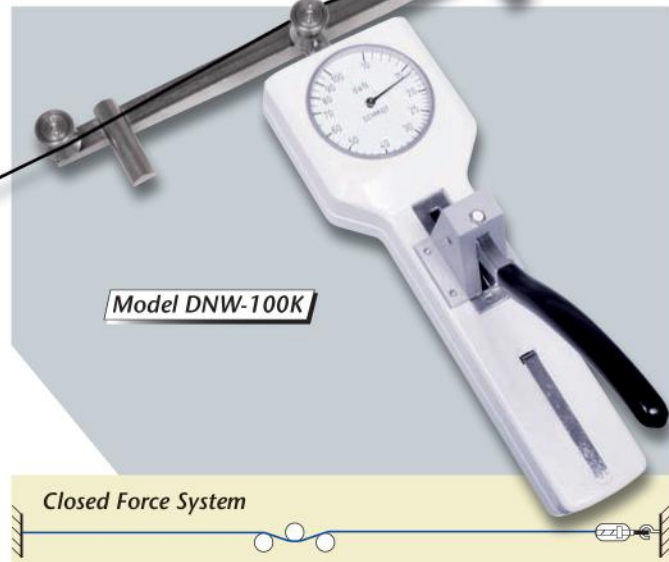
Complete Order No.



Tension meter for measuring pretensioned ropes up to max. 4 mm Ø

## Model DNW

4 tension ranges  
from 10 - 100 daN to 40 - 400 daN



Model DNW-100K



Closed Force System

**Special features:**

- + Can be used only for pretensioned, non-moving ropes
- + Calibration is done using a closed force system
- + Due to the material path the max. error is approx. 3% FS (full scale)
- + Special lever reduces the force to extend outer rollers to capture the material to be measured
- Apart from that the instrument relates to model DN1, but no thickness compensator

Available Models	Tension Ranges	Measuring Head Width*	SCHMIDT Calibration Material**
MODEL	daN	mm	
<b>DNW-100K</b>	10 - 100	265	steel rope 2 mm Ø
<b>DNW-200K</b>	20 - 200	265	steel rope 2 mm Ø
<b>DNW-300K</b>	30 - 300	265	steel rope 3 mm Ø
<b>DNW-400K</b>	40 - 400	265	steel rope 4 mm Ø

\* Outer distance between outside guide rollers  
\*\* SCHMIDT calibration material twisted steel rope

Tension meter for measuring pretensioned ropes, wires etc., up to max. 2 mm Ø

## Model DXH

3 tension ranges  
from 400 - 5000 cN to 5 - 20 daN



Model DXH-10K

**Special features:**

- + Fixed hooks as guide pins
- + Useable for application areas with limited access space
- + Calibration is done in an open force system using a free hanging weight
- + If the instrument is used in a closed force system the accuracy is worse, depending on the fixing length
- Apart from that the instrument relates to model DX2, but no thickness compensator

Available Models	Tension Ranges	Measuring Head Width	SCHMIDT Calibration Material*
MODEL	cN	mm	
<b>DXH-5000</b>	400 - 5000	116	PA: 0.8 mm Ø
<b>DXH-10K</b>	2.5 - 10 daN	116	PA: 1.0 mm Ø
<b>DXH-20K-L</b>	5 - 20 daN	116	PA: 1.5 mm Ø

Other tension ranges and measuring head widths on request.  
Other units of measure available – g or kg.  
\*\* SCHMIDT calibration material Polyamide Monofilament PA (see chart on page 11)

**Guide Rollers**

**Asymmetrical Groove**

Standard Tempered steel

Roller Material

→ see page E →



Subject to change without notice.





# Model TEN

11 tension ranges  
from 0.5 cN - 3 cN to 50 - 170 cN

**Special features:**

- + 2-roller measuring system
- + Small, handy design
- + Large enlacement of thread for stable readings when tension fluctuates rapidly

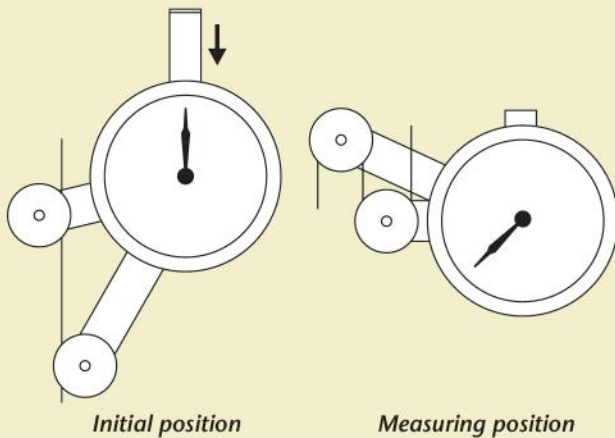
**Standard features:**

- Ball-bearing mounted, V-grooved guide rollers
- Aluminium housing

**Available Models**

Model	Tension Ranges cN
<b>TEN-3K</b>	0.5 - 3
<b>TEN-5K</b>	1 - 5
<b>TEN-10K</b>	2 - 10
<b>TEN-12K</b>	2 - 12
<b>TEN-20K</b>	5 - 20
<b>TEN-30K</b>	5 - 30
<b>TEN-50K</b>	10 - 50
<b>TEN-60K</b>	10 - 60
<b>TEN-70K</b>	10 - 70
<b>TEN-120K</b>	20 - 120
<b>TEN-170K</b>	50 - 170

The instrument is designed for one-hand use. To thread in, place the yarn between the two guide rollers. Push and hold the key button at the instrument. The outer roller will be turned up and the instrument is ready for measuring. The measured value will be displayed at the analog display.



Small, compact tension meter for measuring fibers and threads

**Model TEN-12K**  
Actual size



fig1.:  
a stationary model is available on request



**Guide Rollers**

**V-grooved**

Standard

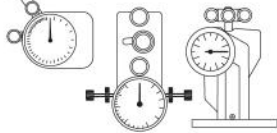
Line Speed  
 $v_{max} \dots m/min$   
Roller Material

900 Aluminium black colored

**Specifications**

**TEN Series**

Accuracy:	± 7% full scale up to 10 cN or ± 5% full scale up to 30 cN or ± 2% full scale for higher 30 cN
Scale diameter:	40 mm
Temperature range:	10 - 50 °C
Air humidity:	85 % RH, max.
Housing material:	Aluminium
Housing dimensions:	87 x 57 x 26 mm (LxWxH)
Weight, net (gross):	approx. 150 g (approx. 260 g)



**Stationary tension meters for continuous tension measurement applications**

**Special features:**

- + Easy online mounting with screws
- + User-set MIN- and MAX-limits alert operator to out-of-tolerance conditions (This feature is not available for Model Q)

**Note:** Stationary tension meters do not include a filament guide and material thickness compensator

**Models Q, MK, DX2S**

**Guide Rollers**

**Model Q, MK**

**V-grooved**

	Line Speed <i>v<sub>max</sub></i> ... m/min	Roller Material
Standard	1000	Hard-coated aluminium
Code T	1000	Plastic (POM) black
Code W	1000	Nickel-plated steel (Model -100 and higher)

→ see page E →

**Model DX2S**

**V-grooved**

Standard	2000	Hard-coated aluminium
Code K	3500	Hard-coated aluminium
Code H	5000	Plasma-coated aluminium (for Model DX2S-120 and higher ranges)
Code T	1000	Plastic (POM) black
Code W	1000	Nickel-plated steel
Code ST	1000	Hardened steel
Code B	1000	Tempered steel for tire cord
Code CE 1	1000	Aluminium ceramic-coated
Code ASY	1000	Hard-coated aluminium
Code ASYB asymmetrical groove	1000	Tempered steel for tire cord (for Model DX2S-120 and higher ranges)

**U-grooved**

Code U	2000	Hard-coated aluminium
--------	------	-----------------------

**Optional Accessories**

**Model MK**

Code D	Tension-detecting screw contacts Adjustable MIN and MAX contacts trigger a signal, as soon as MIN or MAX tension value is reached
--------	--

**Model DX2S**

Code A	Air damping (DX2S-120 to DX2S-5000)
--------	-------------------------------------

**Model Q**

Tension meter with large, easy to read scale (54 mm Ø)



**Available Models**

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration Material**
Q-10	2 - 10	65	PA: 0.12 mm Ø
Q-20	2 - 20	65	PA: 0.12 mm Ø
Q-30	3 - 30	65	PA: 0.12 mm Ø
Q-50	5 - 50	65	PA: 0.12 mm Ø
Q-100	10 - 100	65	PA: 0.12 mm Ø
Q-200	20 - 200	65	PA: 0.12 mm Ø
Q-300	20 - 300	65	PA: 0.20 mm Ø
Q-500	50 - 500	85	PA: 0.20 mm Ø
Q-1000	50 - 1000	85	PA: 0.30 mm Ø

Other tension ranges available on request. Other units of measure available, such as g.

\* Outer distance between outside guide rollers

\*\* SCHMIDT calibration material Polyamide Monofilament PA (see chart on page 11)

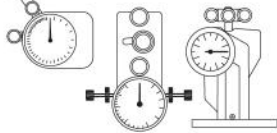
**Specifications**

Calibration:	According to SCHMIDT factory procedure
Accuracy:	±1% full scale (FS) or ±1 graduation on scale
Scale diameter:	54 mm
Temperature range:	10 - 45 °C
Air humidity:	85% RH, max.
Housing material:	Chill-cast aluminium
Housing dimensions:	78 x 62 x 27 mm (L x W x H)
Weight, net (gross):	approx. 300 g (400 g)

**Q Series**

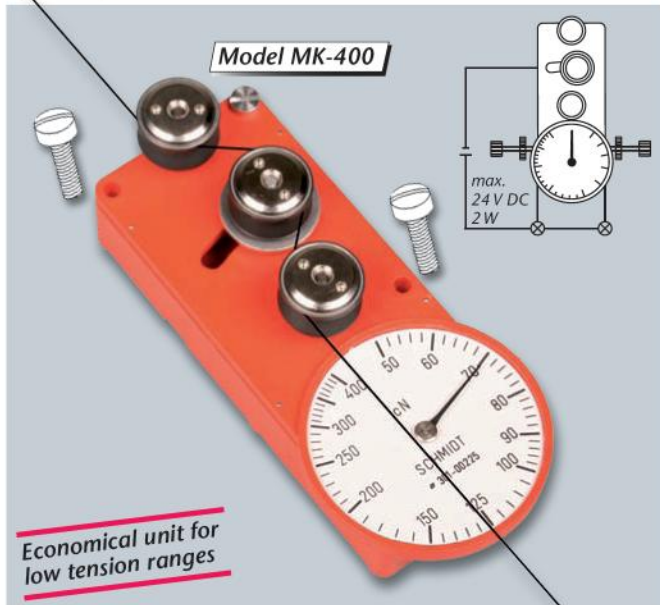
Special calibration using customer supplied samples is available: Please supply a sample of at least 5 m in length.





## Model MK

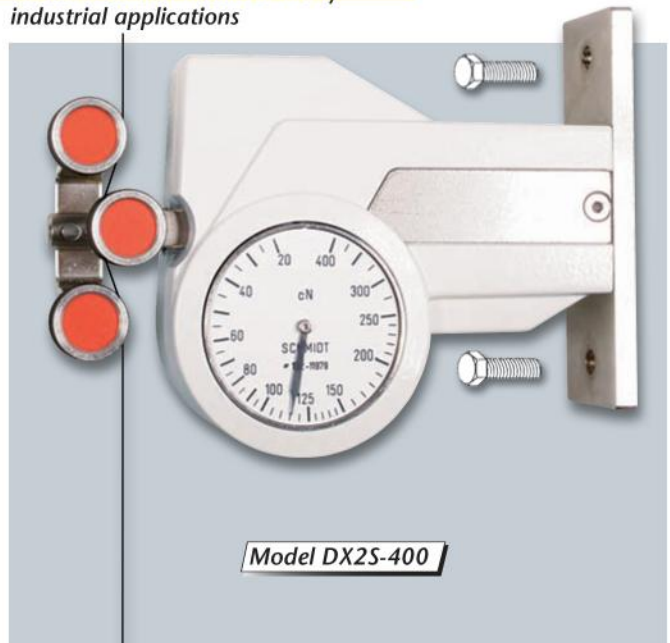
Small, compact and easy to install measuring instrument



Economical unit for low tension ranges

## Model DX2S

Versatile tension meter for many industrial applications



Model DX2S-400

Available Models	Tension Ranges	Measuring Head Width	SCHMIDT Calibration Material*
MODEL	cN	mm	
<b>MK-12</b>	3 - 12	56	PA: 0.12 mm Ø
<b>MK-20</b>	5 - 20	56	PA: 0.12 mm Ø
<b>MK-30</b>	5 - 30	56	PA: 0.12 mm Ø
<b>MK-50</b>	10 - 50	56	PA: 0.12 mm Ø
<b>MK-100</b>	10 - 100	56	PA: 0.12 mm Ø
<b>MK-250</b>	20 - 250	56	PA: 0.12 mm Ø
<b>MK-300</b>	20 - 300	56	PA: 0.20 mm Ø
<b>MK-400</b>	50 - 400	56	PA: 0.20 mm Ø

Other tension ranges available on request. Other units of measure available, such as g.  
\* Suitable for 95% of applications (see also chart on page 11)  
PA = Polyamide Monofilament

Available Models	Tension Ranges	Measuring Head Width*	SCHMIDT Calibration Material**
MODEL	cN	mm	
<b>DX2S-50</b>	10 - 50	54	PA: 0.12 mm Ø
<b>DX2S-120</b>	20 - 120	54	PA: 0.12 mm Ø
<b>DX2S-200</b>	20 - 200	54	PA: 0.12 mm Ø
<b>DX2S-400</b>	20 - 400	54	PA: 0.20 mm Ø
<b>DX2S-1000</b>	50 - 1000	54	PA: 0.30 mm Ø
<b>DX2S-2000</b>	200 - 2000	116	PA: 0.50 mm Ø
<b>DX2S-5000</b>	400 - 5000	116	PA: 0.80 mm Ø
<b>DX2S-8000</b>	1000 - 8000	116	PA: 1.00 mm Ø
<b>DX2S-10 K</b>	2.5 - 10 daN	116	PA: 1.00 mm Ø
<b>DX2S-20 K</b>	5 - 20 daN	216	PA: 1.50 mm Ø

Other tension ranges, measuring head widths, and material path calibrations available on request. Other units of measure available – g or kg.  
\* Outer distance between outside guide rollers  
\*\* Suitable for 95% of applications (see also chart on page 11)  
PA = Polyamide Monofilament

Specifications	MK Series
Calibration:	According to SCHMIDT factory procedure
Accuracy:	±1% full scale (FS) or ±1 graduation on scale
Scale diameter:	41 mm
Temperature range:	10 - 45 °C
Air humidity:	85% RH, max.
Housing material:	Plastic (Makrolon)
Housing dimensions:	96 x 44 x 23 mm (L x W x H)
Weight, net (gross):	approx. 80 g (200 g)

**Specifications** same as Model DX2 (see page A4)

The following models of the DX series are available as stationary models for fixed installation:  
Model DXE → Model DXES    Model DXF → Model DXFS  
Model DXB → Model DXBS    Model DXT → Model DXTS

To place an order please indicate the complete model number, e.g.:

Model with tension range  
Code for guide rollers (if not standard)  
Code for accessory  
Complete Order No.

**DX2S-400** + **K** + **A** = **DX2S-400-K-A**



# PT SERIES

Tension range  
from 0.5 - 100cN

**Special features**

Model PT-100 and PT-100-L:

- + Easy threading of the material to be measured using the cone shaped guide rollers and turning the instrument by 180°
- + Automatic »Zero setting« independent to measuring position
- + Tension meter can be used for right and left hand use
- + Adjustable electronic damping to provide steady tension readings
- + Switchable measuring units cN or grs
- + The average reading of a series of measurement can be displayed
- + LiPo accumulator

**Standard features**

- Tension meter with small, compact aluminium housing
- Ball-bearing mounted, V-grooved guide rollers
- Tension meter with easy to read LCD display
- CE proofed, interference resistance about static charge
- Inspection Certificate with Calibration Report optionally available

Economical low tension measuring instruments  
for checking fibers, threads, yarns etc.



Model PT-100

Actual size

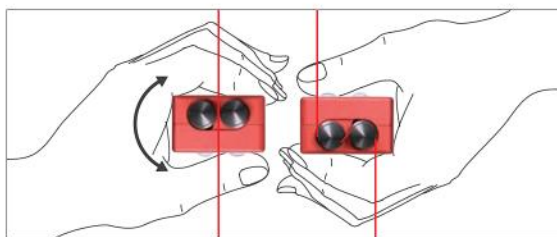


fig. 1: To thread in the material the instrument has to be turned by 180°

**Guide Rollers**

**V-grooved**

**Standard**

Line Speed  
v<sub>max</sub>: ... m/min

Roller Material

→ see page E →

2000

Hard-coated aluminium

**Available Models**

MODEL

Measuring Range  
Tension  
cN

Measuring Range  
Speed  
m/min

Measuring Range  
Length  
m

Measuring  
Head Width\*  
mm

SCHMIDT  
Calibration Material\*\*

**PT-100**

0.5 - 100.0

---

---

24

PA: 0.20 mm Ø

**PT-100-L**

0.5 - 100.0

0 - 1999

0 - 1999

24

PA: 0.20 mm Ø

\* Outer distance between outside guide rollers

\*\* Suitable for 95% of applications (see also chart on page 11) PA = Polyamide Monofilament





## Model PT-100-L

Tension meter mostly used for  
knitting machines

### Special Features Model PT-100-L:

- + Multifunctional instrument:
  - Tension Meter
  - Yarn Speed Meter
  - Length Meter to determine the yarn consumption of a single feeder for one or more (max. 10 revolutions) machine cycles of a circular knitting machine

### Length measurement -

#### 2 operation modes:

- „Manual“ (without external Sensor):  
The instrument works as long as the operator presses the button
- „Auto“ (with magnet sensor):  
Sensor and magnet are supplying a start/stop signal for a user-defined number of machine revolutions (1 to 10)

**1<sup>st</sup>** IN TENSION  
METERS  
WORLDWIDE®



**3IN1**

- Tension Meter
- Yarn Speed Meter
- Yarn Consumption Meter

Multifunctional tension  
meter with low weight

### Specifications

### Model PT-100 and PT-100-L

Calibration:	According to SCHMIDT factory procedure
Accuracy:	± 1.5 % FS* and ± 1 digit, Length measuring ± 0.5 % FS*; 1 digit
Overrange (approx.):	10% FS*, without accuracy guarantee
Overload protection:	200%
Measuring principle:	Strain gauge bridge
Measuring units:	cN, grs switchable m, in, m/min, in/min (only PT-100-L)
Display update rate:	2 times/sec
Damping:	Selectable electronic damping (moving averaging)
Display:	LCD 3 ½ digits, 9 mm high
Temperature range:	10 - 45 °C
Air humidity:	5% RH, max.
Power supply:	LiPo accumulator (~ 40 h continuous use, charging time 3 ½ h) and AC adapter 100 - 240 V with adapters (EU/USA/UK)
Auto power off:	Automatically after 3 minutes of non use
Housing material:	Aluminium
Housing dimensions:	141 x 36 x 22 mm (L x W x H)
Weight, net (gross):	approx. 170 g (approx. 500 g)

\* FS = Full Scale

Model PT-100-L

Actual size



with sensor and  
magnet for measuring  
yarn consumption

### Accessories

Model PT-100-L (includes delivery)

PT-S

Sensor with cable (3.50 m), magnet and  
clamping angle



## ZE SERIES

4 Tension ranges  
from 0.5 - 50 cN to 1- 500 cN

### Special features:

- + Simple handling
- + Automatic »Zero setting« independent to measuring position
- + Adjustable electronic damping to provide steady tension readings
- + Easy to read LCD display
- + Filament guide and roller shifting mechanism ensure easy acquisition of the running material
- + Light weight
- + LiPo accumulator

### Standard features:

- Everything in operator's view:
  - the guide rollers
  - the measured material
  - the readings
- Ball-bearing mounted, V-grooved guide rollers
- Housing made of high-strength plastic
- CE proofed, interference resistance about static charge
- Inspection Certificate with Calibration Report optionally available

Economical low tension measuring instruments  
for checking fibers, yarns and fine wires



Slim filament guide with small guide rollers – ideal for limited access space



**Model ZEF-100**  
Actual size

## Model ZEF

### Available Models

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration Material**
<b>ZEF-50</b>	0.5 - 50.0	43	PA: 0.12 mm Ø
<b>ZEF-100</b>	0.5 - 100.0	43	PA: 0.12 mm Ø
<b>ZEF-200</b>	1 - 200	43	PA: 0.12 mm Ø

\* Width of filament guide

\*\* Suitable for 95% of applications (see also chart on page 11)  
PA = Polyamide Monofilament

### Guide Rollers

	Line Speed v <sub>max</sub> ... m/min	Roller Material
<b>V-grooved</b>		
<b>Standard</b>	900	Hard-coated aluminium
<b>Code K</b>	2000	Hard-coated aluminium
<b>Code T</b>	450	Plastic (POM) black
<b>Code W</b>	450	Nickel-plated steel

→ see page E →



fig. 1: Model ZEF-100-T with easy running plastic rollers to measure Spandex (Lycra) filaments

Special calibration using customer supplied samples is available:  
Please supply a sample of at least 5 m in length.





Universal tension meter for a variety of applications  
in the textile and wire industries



**Model ZED-500**  
Actual size

With bigger rollers  
for universal use

**1<sup>st</sup>** IN TENSION  
METERS  
WORLDWIDE®

**Specifications**

**Model ZEF and ZED**

Calibration:	SCHMIDT factory procedure
Accuracy:	± 1 % FS* and ± 1 digit, typical ± 0.5 % FS*
Overrange (approx.):	10 % FS*, without accuracy guarantee
Overload protection:	100 % FS*
Measuring principle:	Strain gauge bridge
Measuring roller deflection:	0.5 mm max.
Display:	3-digit LCD, 10 mm high Model ZEF-50, ZEF-100: 3½-digit LCD
Display update rate:	2 times / sec
Damping:	Selectable electronic damping (moving averaging)
Signal processing:	digital
Temperature range:	10 - 45 °C
Air humidity:	85 % RH, max.
Power supply:	LiPo accumulator (about 80 h continuous use, charging time approx. 3 ½ h) and AC Adapter with adapters (EU/USA/UK)
Housing material:	Plastic (POM)
Housing dimensions:	157 x 85 x 32 mm (L x W x H)
Weight, net (gross):	approx. 200 g (600 g)

\* FS = Full Scale

**Model ZED**

**Available Models**

MODEL	Tension Range cN	Measuring Head Width* mm	SCHMIDT Calibration Material**
<b>ZED-200</b>	1 - 200	63	PA: 0.20 mm Ø
<b>ZED-500</b>	1 - 500	63	PA: 0.20 mm Ø

\* Width of filament guide

\*\* Suitable for 95 % of applications (see also chart on page 11)  
PA = Polyamide Monofilament

**Guide Rollers**

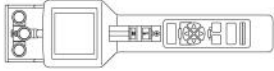
V-grooved	Line Speed v <sub>max.</sub> ... m/min	Roller Material
<b>Standard</b>	2000	Hard-coated aluminium
<b>Code K</b>	3500	Hard-coated aluminium
<b>Code H</b>	5000	Plasma-coated aluminium
<b>Code T</b>	1000	Plastic (POM) black
<b>Code W</b>	1000	Nickel-plated steel
<b>Code CE2</b>	1000	Aluminium ceramic-coated

→ see page F →

Special calibration using customer supplied samples is available:  
Please supply a sample of at least 5 m in length.

To place an order  
please indicate the complete model number, e.g.:

Model with tension range  
Code for guide rollers  
(if not standard)  
Complete Order No.  
**ZEF-200** + **K** = **ZEF-200-K**



## DT SERIES

12 Tension ranges  
from 1 - 200 cN to 0.6 - 60 daN

### Special features Models DTMB and DTMX:

- + Large, backlight LCD-display with 3 different displays:
  - numeric,
  - numeric with live load bar,
  - numeric with graph (time-tension)
- + The display rotates in 90° steps for better reading (see page C 9)
- + New, unique, force reduced material catching system
- + Thickness compensator to reach highest accuracy: the diameter of the material to be measured can be set with a wheel and will be displayed in the screen (not available for all models)
- + Automatic „Zero-Setting“ in each measuring position using a special sensor technique
- + High speed data sampling (internal 8 kHz) and recording of MIN-, MAX-, LAST-reading, PEAKS, AVG and standard deviation
- + Programmable MIN- and MAX-alarms - indication in the display, if reading is out of limits
- + Material memory locations for customer made calibrations: 4 model DTS and 9 model DTX
- + Cal. adjustment for fine tuning of the calibration, if material differs from the used calibration material
- + Flexible menu set-up to meet operators demand
- + Menu set-up in english or german language
- + Selectable units of measurement: cN, daN, g, kg, N, lb
- + Rubberized handle provides a secure hold in the operators' hand

### Standard features Models DTS and DTX:

- Everything in operator's view:
  - the guide rollers
  - the measured material
  - the readings
- Filament guide and roller shifting mechanism ensure easy acquisition of the running material
- Ball-bearing mounted, V-grooved guide rollers
- Rugged aluminium housing
- LiPo Accu (approx. 40 h continuous use) with AC adapter
- CE approved (tested for electromagnetic compatibility)
- Inspection Certificate with calibration report optionally available

Electronic tension meters providing detailed process data and analysis. Two models available: DTS (basic unit) and DTX (with memory and output)



## Model DTS

**Model DTS:**  
The basic unit for easy use, for many applications, without interface

Model DTS-1000

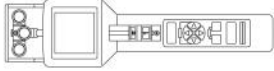
**1<sup>st</sup>** IN TENSION METERS WORLDWIDE®



Easy mounting for online applications (Code MH)

Optional for DT series





## Model DTX

For applications requiring additional process data,  
such as ISO 9000 certified quality management systems



**The DTX model also provides:**  
 - Large internal memory  
 - Statistical evaluation  
 - Interface for PC connection

Model DTX-5000

**Wifi**  
(optional)



**Additional features model DTX:**

- + Memory for 60.000 readings
- + USB interface
- + 4 different memory modes:  
**Mode S:** statistics only  
**Mode H:** storage of the X-Y-diagram for reviewing after finishing a series of measurement (e.g. short time spooling)  
**Mode C:** continuous logging over a user set time and different series of measurement (2 Hz)  
**Mode F:** fast, continuous logging over a user set time and different series of measurement (1000 Hz)
- + Factory-provided calibration with PA Monofilament and Cu wire
- + 9 Material memory locations for customer made calibrations
- + Wi-Fi modul for wireless communication with a PC (optional)
- + Delivery includes: tension meter, USB-cable, and software »Tension Inspect 3«

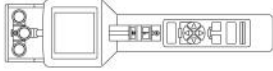


Model DTX for data acquisition and evaluation (Software see page C9)



Thickness compensator: The display shows the adjusted material diameter

Standard for model DTS and DTX (see page C7/C8)



# Model DTS

## Available Models

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration Material** Polyamid (PA)-Monofil	Textile Industry Applications e.g. yarn count	Wire Industry Applications e.g. soft-annealed copper wire	Material thickness compensator included
<b>DTS-200</b>	1 - 200.0	66	0.12 mm Ø	max. 200 tex	max. 0.15 mm Ø	
<b>DTS-500</b>	1 - 500.0	66	0.12 + 0.20 mm Ø	max. 500 tex	0.05 - 0.25 mm Ø	✓
<b>DTS-1000</b>	10 - 1000	66	0.20 + 0.40 mm Ø	max. 1000 tex	0.10 - 0.40 mm Ø	✓
<b>DTS-2000</b>	20 - 2000	66	0.40 + 0.70 mm Ø	max. 2000 tex	0.30 - 0.60 mm Ø	✓
<b>DTS-2500</b>	25 - 2500	116	0.40 + 0.70 mm Ø	max. 2500 tex	0.30 - 0.70 mm Ø	✓
<b>DTS-4000</b>	40 - 4000	66	0.50 + 0.90 mm Ø	max. 4000 tex	0.35 - 0.90 mm Ø	✓
<b>DTS-5000</b>	50 - 5000	116	0.60 + 1.20 mm Ø	max. 5000 tex	0.40 - 1.00 mm Ø	✓
<b>DTS-10K</b>	0.1 - 10.00 daN	116	0.80 + 1.40 mm Ø	max. 10000 tex	0.70 - 1.40 mm Ø	✓
<b>DTS-20K</b>	0.2 - 20.00 daN	166	1.20 + 1.80 mm Ø	max. 20000 tex	1.00 - 1.80 mm Ø	✓
<b>DTS-30K</b>	0.3 - 30.00 daN	216	1.40 + 2.20 mm Ø	max. 30000 tex	1.20 - 2.00 mm Ø	✓
<b>DTS-50K</b>	0.5 - 50.00 daN	216	Steelrope 1.5 mm Ø (7x7x0.2)	max. 50000 tex	1.40 - 2.20 mm Ø	
<b>DTS-60K-V1</b>	0.6 - 60.00 daN	280	Steelrope 2.0 mm Ø (7x7x0.3)	max. 60000 tex	1.80 - 3.00 mm Ø	

Other measuring head widths available on request.

\* Depending on model, either width of filament guide or outer distance between outside guide rollers  
\*\* Suitable for 95% of applications (see also chart on page 11)

## Guide Rollers

Model DTS	Line Speed V <sub>max</sub> ... m/min	Roller Material
<b>V-grooved</b>		
Standard	2000	Hard-coated aluminium
Code K	3500	Hard-coated aluminium
Code H	5000	Plasma-coated aluminium
Code T	1000	Plastic (POM) black
Code W	1000	Nickel-plated steel
Code ST	1000	Hardened steel
Code B	1000	Tempered steel for tire cord
Code CE2	1000	Aluminium ceramic-coated
Code V1	1000	Hard-coated aluminium (only for tension range 60 daN)
<b>asymmetrical groove</b>		(not for tension range 200 cN)
Code ASY	1000	Hard-coated aluminium
Code ASYB	1000	Tempered steel for tire cord – Gauge is without filament guide –
<b>U-grooved</b>		
Code U	2000	Hard-coated aluminium (not for tension range 200 cN)

→ see page E →

## Specifications

Calibration:	According to SCHMIDT factory procedure
Accuracy:	5% to 100% of range: ± 0.5% FS* and ± 1 digit or better
Remaining range and other calibration material:	± 3% FS* and ± 1 digit or better
Memory for material curves:	1 for SCHMIDT calibration plus 4 for customized calibrations
Measuring units:	Force: cN, daN, g, kg, N or lb Thickness: mm or inch
Overrange:	Approx. 10% FS*, without accuracy guarantee
Overload protection:	100% FS*
Measuring principle:	Strain gauge bridge
Measuring roller deflection:	0.2 mm max.
Signal processing:	Digital, 16 bit A/D converter
Measuring frequency:	Max. 1 kHz (1000 measurings/sec.)
Display:	Graphic LCD
3 different displays:	Numeric, Numeric + bargraph, Numeric + X-Y-diagram (time tension)
Display update rate:	2 times per second
Memory:	MIN, MAX, PEAKS, AVG and LAST
Thickness compensation:	Max. 2.5 mm (not for all models)
Temperature range:	10 - 45 °C
Air humidity:	85% RH, max.
Power supply:	LiPo accumulator (about 40 hours of continuous use)
Housing material:	Die-cast aluminium
Housing dimensions:	265 x 78.5 x 46 mm (L x W x H)
Weight, net (gross):	Up to Model-50K 875 g (1550 g) DTS-60K-V1 1040 g (2700 g)

\* FS = Full Scale

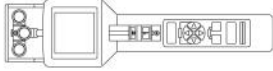
## Optional Accessories

### Model DTS

Code MH	Mounting thread for online use
---------	--------------------------------

Special calibration using customer supplied samples is available:  
Please supply a sample of at least 5 m in length.





# Model DTX

## Available Models

Model	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration Material** Position Tex Polyamid (PA)-Monofil	Textile Industry Applications e.g. yarn count	SCHMIDT Calibration Material*** Position Wire Soft-annealed copper wire	Wire Industry Applications e.g. soft-annealed copper wire	Material thickness compensator included
<b>DTX-200</b>	1 - 200.0	66	0.12 mm Ø	max. 200 tex	0.10 mm Ø	max. 0.15 mm Ø	
<b>DTX-500</b>	1 - 500.0	66	0.12 + 0.20 mm Ø	max. 500 tex	0.16 + 0.25 mm Ø	0.05 - 0.25 mm Ø	✓
<b>DTX-1000</b>	50 - 1000	66	0.20 + 0.40 mm Ø	max. 1000 tex	0.25 + 0.40 mm Ø	0.10 - 0.40 mm Ø	✓
<b>DTX-2000</b>	20 - 2000	66	0.40 + 0.70 mm Ø	max. 2000 tex	0.40 + 0.60 mm Ø	0.30 - 0.60 mm Ø	✓
<b>DTX-2500</b>	25 - 2500	116	0.40 + 0.70 mm Ø	max. 2500 tex	0.40 + 0.60 mm Ø	0.30 - 0.70 mm Ø	✓
<b>DTX-4000</b>	40 - 4000	66	0.50 + 0.80 mm Ø	max. 4000 tex	0.50 + 0.80 mm Ø	0.35 - 0.90 mm Ø	✓
<b>DTX-5000</b>	50 - 5000	116	0.60 + 1.20 mm Ø	max. 5000 tex	0.60 + 1.00 mm Ø	0.40 - 1.00 mm Ø	✓
<b>DTX-10K</b>	0.1 - 10.00 daN	116	0.80 + 1.40 mm Ø	max. 10000 tex	0.70 + 1.20 mm Ø	0.70 - 1.40 mm Ø	✓
<b>DTX-20K</b>	0.2 - 20.00 daN	166	1.20 + 1.80 mm Ø	max. 20000 tex	Steel rope 1.5 mm Ø	1.00 - 1.80 mm Ø	✓
<b>DTX-30K</b>	0.3 - 30.00 daN	216	1.40 + 2.00 mm Ø	max. 30000 tex	Steel rope 1.5 mm Ø	1.20 - 2.00 mm Ø	✓
<b>DTX-50K</b>	0.5 - 50.00 daN	216	Steel rope 1.5 mm Ø (7x7x0.2)	max. 50000 tex	Steel rope 2.0 mm Ø (7x7x0.3)	1.40 - 2.20 mm Ø	
<b>DTX-60K-V1</b>	0.6 - 60.00 daN	280	Steel rope 2.0 mm Ø (7x7x0.3)	max. 60000 tex	Steel rope 2.5 mm Ø (7x7x0.4)	1.80 - 3.00 mm Ø	

Other measuring head widths available on request.

\* Depending on model, either width of filament guide or outer distance between outside guide rollers

\*\* Suitable for 95% of applications (see also chart on page 11) – PA = Polyamide Monofilament

\*\*\* Accuracy: ±3% full scale and ±1 digit

## Guide Rollers same as Model DTS

## Standard Accessories Model DTX

**SW-TI3** » Tension Inspect 3« software (WIN XP and higher), incl. USB cable

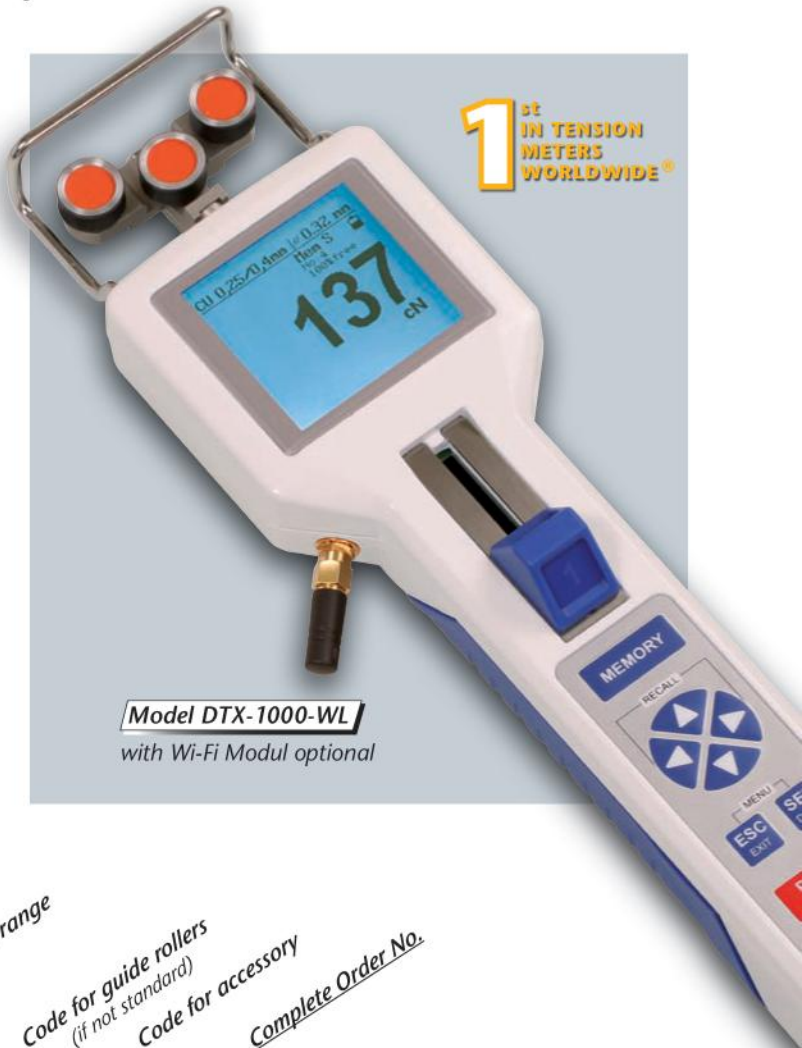
## Optional Accessories Model DTX

**Code MH** Mounting thread for online use  
**Code WL** Wi-Fi modul for wireless data transfer

## Specifications

Output signal:	USB
Memory:	60.000 values at 255 measuring periods
Memory for material curves:	2 for SCHMIDT calibration plus 9 for customized calibrations
Memory modes:	4 memory modes with statistical evaluation
Digimatic:	

Special calibration using customer supplied samples is available:  
Please supply a sample of at least 5 m in length.



**Model DTX-1000-WL**  
with Wi-Fi Modul optional

Model with tension range

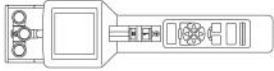
Code for guide rollers  
(if not standard)

Code for accessory

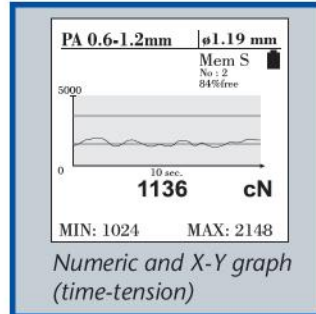
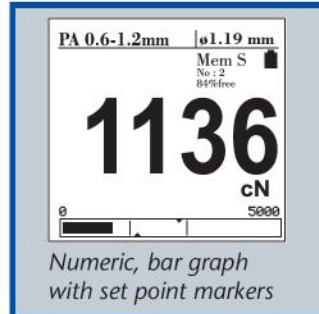
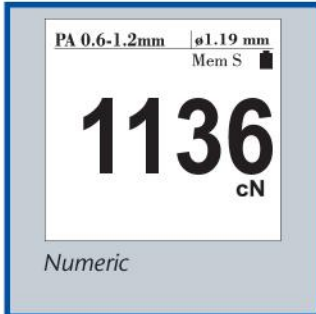
Complete Order No.

To place an order please indicate the complete model number, e.g.:

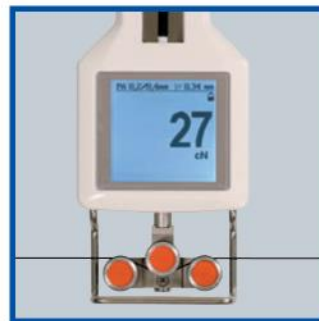
**DTX-5000** + **H** + **WL** = **DTX-5000-H-WL**



## DT series: a display with many possibilities



Large LCD-display with 3 selectable display modes



Depending to the measuring position the LCD display is automatically rotating in 90° steps, to have the best view at the display

**1<sup>st</sup>** IN TENSION METERS WORLDWIDE®

## Model DTX for storing and analyzing the measured data with the «software Tension Inspect 3»

«Tension Inspect 3» - Software to display and store on a PC. The series DTX can be connected to a PC using the USB output or the optional Wi-Fi modul

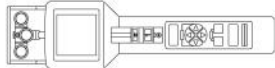
### Features:

- Real-time reading
- The readings are also shown in a X-Y- diagram (time/date-tension) with zoom function
- Recording of the buffered readings as CSV-file
- Online recording with automatic storage of the readings as CSV file
- 2 different statistics:
  - a) statistic of all recorded values
  - b) statistic of the buffered diagram readings
- Adjustable set-points with protocol
- Timeshift function for subsequent detailed data viewing of the diagram
- Reloading and displaying of stored readings (PC file and memory of DTX)
- Creating of a HTML report
- Download of values to Excel
- Printing of stored values using Excel functions



This software can be use for all other SCHMIDT Tension Meters





**Special purpose tension meter for measuring all kinds of tapes and bands, such as textile ribbon, films, foils, fiber bunches etc.**

**Special features:**

- + Dual-flanged outer guide rollers with various widths, from 7 mm to 41 mm (single-flanged rollers optional)
- Apart from that the instruments relate to model DTS and DTX  
**Note:** These models do not include a filament guide and material thickness compensator

**When selecting the instrument for your specific application, please keep in mind that:**

1. Rollers of different widths are not interchangeable by the user
2. The roller width should correspond with the width of the material to be measured. Otherwise incorrect measuring results may occur and the instrument may be damaged

**To assist you in selecting the right tension meter for your specific application, please furnish:**

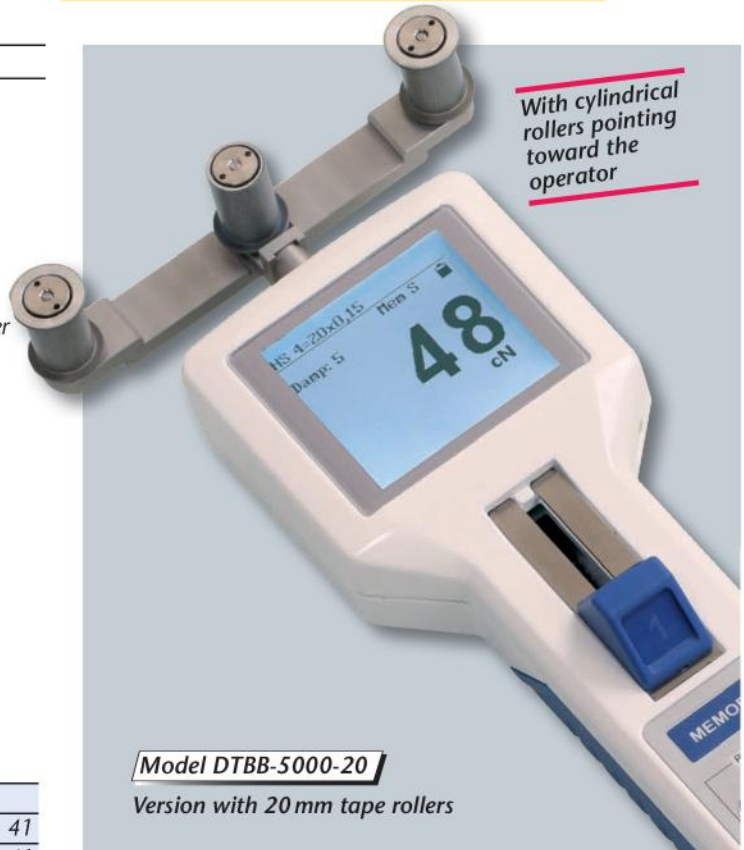
- Kind and dimensions of the material to be measured
- Expected tension range
- Material sample of about 5 m

**Models DTSB, DTXB**

Available Models	Tension Ranges* cN	Measuring Head Width** mm	Roller Widths mm
<b>DTSB-500</b>	5.0-500.0	55	7, 10, 15, 20
<b>DTSB-1000</b>	50-1000	55	7, 10, 15, 20, 30, 41
<b>DTSB-2000</b>	100-2000	55	7, 10, 15, 20, 30, 41
<b>DTSB-2500</b>	150-2500	117	7, 10, 15, 20, 30, 41
<b>DTSB-4000</b>	200-4000	67	7, 10, 15, 20, 30, 41
<b>DTSB-5000</b>	250-5000	117	7, 10, 15, 20, 30, 41
<b>DTSB-10K</b>	0.5-10.00 daN	117	7, 10, 15, 20, 30
<b>DTSB-20K</b>	1.0-20.00 daN	167	7, 10, 15, 20, 30
<b>DTSB-30K</b>	1.5-30.00 daN	217	7, 10, 15
<b>DTSB-50K</b>	2.5-50.00 daN	217	7, 10
<b>DTXB-500</b>	5.0-500.0	55	7, 10, 15, 20
<b>DTXB-1000</b>	50-1000	55	7, 10, 15, 20, 30, 41
<b>DTXB-2000</b>	100-2000	55	7, 10, 15, 20, 30, 41
<b>DTXB-2500</b>	150-2500	117	7, 10, 15, 20, 30, 41
<b>DTXB-4000</b>	200-4000	67	7, 10, 15, 20, 30, 41
<b>DTXB-5000</b>	250-5000	117	7, 10, 15, 20, 30, 41
<b>DTXB-10K</b>	0.5-10.00 daN	117	7, 10, 15, 20, 30
<b>DTXB-20K</b>	1.0-20.00 daN	167	7, 10, 15, 20, 30
<b>DTXB-30K</b>	1.5-30.00 daN	217	7, 10, 15
<b>DTXB-50K</b>	2.5-50.00 daN	217	7, 10

Other measuring head widths available on request.  
\* SCHMIDT calibration material textile ribbon or film, depending on tension range and roller width  
\*\* Outer distance between outside guide rollers

**Models DTSB, DTXB**



**Guide Rollers**  
Line Speed  
V<sub>max</sub> ... m/min  
Roller Material → see page E →

<b>Standard</b>	1000 Hard-coated aluminium (Exception: 7 mm rollers are made of nickel-plated steel)
-----------------	---

Other roller materials (nickel-plated steel or plastic), as well as special coatings (anti adhesive or carbon fibres - NAV optimized) are available on request.

**Optional Accessories**

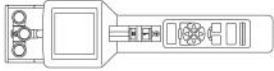
<b>Code MH</b>	Mounting thread for online use
<b>Code WL</b>	Wi-Fi modul for wireless data transfer (only model DTXB)

**Specifications** same as DTS or DTX (see page C7 and C8)

Special calibration using customer supplied samples is available:  
Please supply a sample of at least 5 m in length.

To place an order please indicate the complete model number, e.g.:

Model with tension range  
Roller width in mm  
Code for accessory  
Complete Order No.  
**DTBB-10K** + **10** + **L** = **DTBB-10K-10-L**



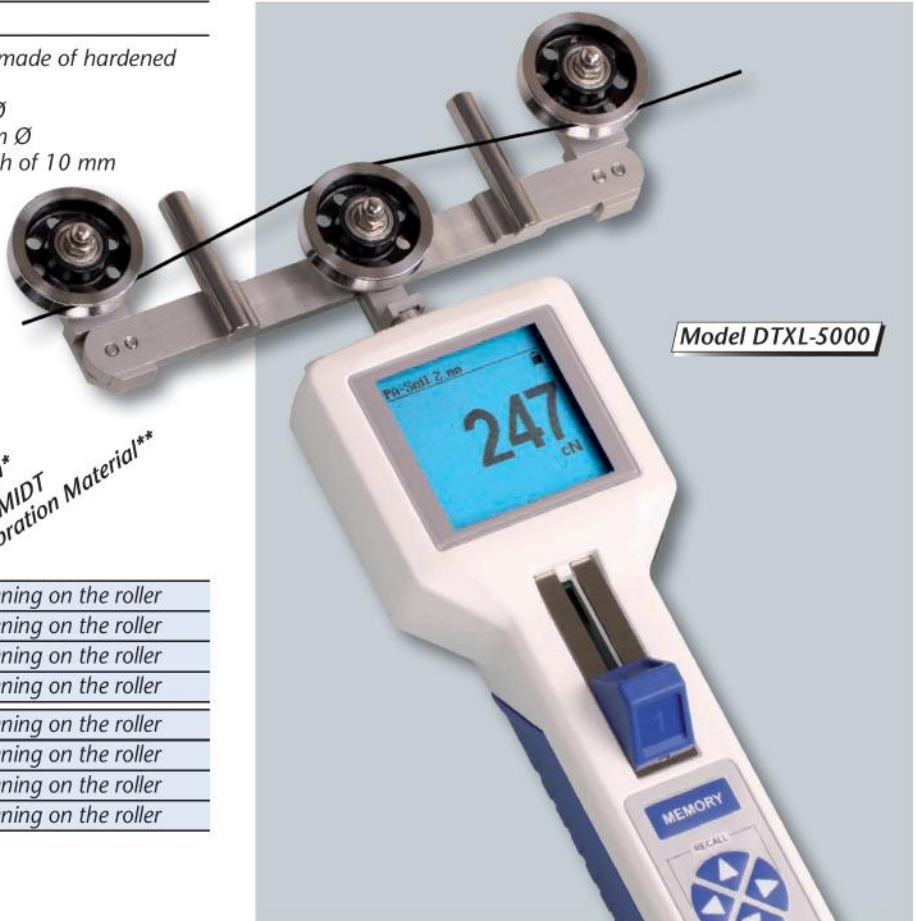
**Special purpose tension meter with large roller diameter and centre distance for minimized material deflection**

**Special features:**

- + Large, ball-bearing mounted guide rollers, made of hardened steel with 29.5 mm groove diameter
  - V-grooved for material with max. 5 mm Ø
  - U-grooved for material with 3 up to 5 mm Ø
  - Tape grooved for material with max. width of 10 mm
- + Large bending radius assures gentle handling of the material being measured
- + Special guides on the bracket assembly permit easy material acquisition
- Apart from that the instruments relate to model DTS and DTX  
**Note:** These models do not have a built-in material thickness compensator

**Model DTSL, DTXL**

For buffer tubes, cables, fibre strands, ropes, tapes etc., up to max. 10 mm Ø, as well as 10 mm width



**Model DTXL-5000**

**Available Models**

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration Material**
<b>DTSL-2500</b>	150-2500	185	depending on the roller
<b>DTSL-5000</b>	250-5000	185	depending on the roller
<b>DTSL-10K</b>	1.00-10.00 daN	235	depending on the roller
<b>DTSL-20K</b>	2.00-20.00 daN	235	depending on the roller
<b>DTXL-2500</b>	150-2500	185	depending on the roller
<b>DTXL-5000</b>	250-5000	185	depending on the roller
<b>DTXL-10K</b>	1.00-10.00 daN	235	depending on the roller
<b>DTXL-20K</b>	2.00-20.00 daN	235	depending on the roller

\* Outer distance between outside guide rollers  
\*\* with convenient material for each roller design

**Guide Rollers**

→ see page E →

	Line Speed v <sub>max.</sub> ... m/min	Roller Material
<b>V-grooved</b>		
Standard	4000	Hardened steel (max. Ø 5 mm)
<b>U-grooved</b>		
Code R1	4000	Hard chrome-plated steel (radius R5)
<b>Tape roller</b>		
Code B6	2000	Hardened steel, width 6 mm
Code B10	2000	Hardened steel, width 10 mm

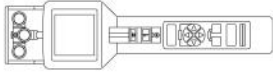
Large guide rollers minimize material deflection

**1<sup>st</sup> IN TENSION METERS WORLDWIDE®**

**Optional Accessories**   **Specifications**   **same as DTS or DTX**  
(see page C7 and C8)

Subject to change without notice.





**Special purpose tension meter with large roller diameter and centre distance or small measuring head where access space is limited**

**Special features DTSF and DTXF:**

- + Large, V-grooved guide rollers, ball-bearing mounted 32 mm Ø
- + Large bending radius assures gentle handling of the material being measured
- + Special guides on the bracket assembly permit easy material acquisition

**Special features DTSE and DTXE:**

- + Turned-up outer finger edges guide the running filament into the roller grooves
  - + Length of measuring head approx. 64 mm
  - + Small, ball-bearing mounted, V-grooved guide rollers
  - Apart from that the instruments relate to model DTS and DTX
- Note:** These models do not have a material thickness compensator

**Models DTSF, DTXF, DTSL, DTXL**

Available Models		Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration Material**
MODEL				
<b>DTSF-200</b>	<b>DTXF-200</b>	1.0-200.0	140	PA: 0.12 mm Ø
<b>DTSF-500</b>	<b>DTXF-500</b>	1.0-500.0	140	PA: 0.20 mm Ø
<b>DTSF-1000</b>	<b>DTXF-1000</b>	10-1000	140	PA: 0.30 mm Ø
<b>DTSF-2000</b>	<b>DTXF-2000</b>	20-1000	140	PA: 0.50 mm Ø
<b>DTSE-200</b>	<b>DTXE-200</b>	1.0-200	36	PA: 0.12 mm Ø
<b>DTSE-500</b>	<b>DTXE-500</b>	1.0-500	36	PA: 0.20 mm Ø
<b>DTSE-1000</b>	<b>DTXE-1000</b>	10-1000	36	PA: 0.30 mm Ø
<b>DTSE-2000</b>	<b>DTXE-2000</b>	20-1000	36	PA: 0.50 mm Ø

\* Outer distance between outside guide rollers  
\*\* Suitable for 95 % of applications (see also chart on page 11)  
PA = Polyamide Monofilament

**Guide Rollers**

DTSE, DTXF	Line Speed v <sub>max.</sub> ... m/min	Roller Material
<b>V-grooved</b>		
Standard	4000	Hard-coated aluminium
Code T	4000	Plastic (PVC) red (Same dimensions as standard roller)

→ see page E →

**DTSE, DTXE**

V-grooved	Line Speed v <sub>max.</sub> ... m/min	Roller Material
<b>V-grooved</b>		
Standard	900	Hard-coated aluminium
Code K	2000	Hard-coated aluminium

**Optional Accessories**    **Specifications**    **same as DTS or DTX**  
(see page C7 and C8)

**Model DTSF, DTXF**

For fragile filaments such as optical fibres, carbon single fibers and technical fibres etc., up to max. 1.5 mm Ø



**Model DTFX-200-T**

with guide rollers  
Code T

**Model DTSE, DTXE**

These tension meters are recommended where the standard models DTS and DTX cannot be used



**Model DTXE-1000**

Ideal for applications with limited access space

**1<sup>st</sup>** IN TENSION METERS WORLDWIDE®

To place an order please indicate the complete model number, e.g.:

Model with tension range  
Code for guide rollers (if not standard)  
Complete Order No.  
**DTXL-2500** + **B10** = **DTXL-2500-B10**





# ET SERIES

3 Tension ranges  
from 0.5 - 100 cN to 2 - 500 cN

Electronic tension meters for hard to reach and limited access space applications. Two models available: ETB (basic unit) and ETX (with memory and output)

### Special features Models ETX and ETPX

- + USB interfaces for connection to a PC
- + Memory of max. 4000 tension values split up to 255 series of measurements and statistics (LAST, AVG, MIN, MAX, PEAK-MIN and PEAK-MAX)
- + 4 different memory modes:
  - **Mode S:** only statistics
  - **Mode L:** statistics plus 10 displayed values of each series of measurements
  - **Mode C:** statistics plus 4000 displayed values split up to 255 series
  - **Mode F:** as C plus higher sampling rate of max. 100Hz
- + **Delivery includes:** tension meter, connecting cable for PC and Software »Tension Inspect 3«

Smallest measuring head – only for textile applications and copper wire, soft-annealed (max. 0.17 mm Ø)

**Model ETB-200**

Actual size

**1<sup>st</sup>** IN TENSION METERS WORLDWIDE®

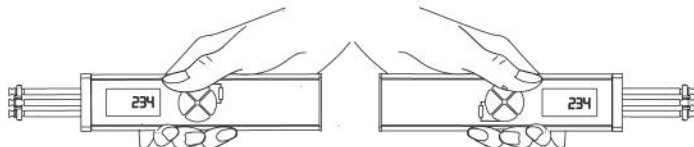
**Models ETPB and ETPX**



fig. 1: Model ETPB with ceramic pins for line speeds up to  $v_{max}$  6000 m/min

### Standard features:

- Models ETB and ETX with ball-bearing mounted, V-grooved guide rollers for line speeds up to  $v_{max}$  2000 m/min
- Models ETPB and ETPX with ceramic pins for line speeds up to  $v_{max}$  6000 m/min
- Automatic »Zero setting« independent to measuring position
- Storage of AVG, MIN, MAX and PEAK tension values which can be recalled in the display
- Adjustable electronic damping for better reading when tension is constantly changing
- The display can be background lightened for better reading if necessary
- Changeable units cN and g
- Display update time 0.5 sec
- LiPo accumulator
- CE approved (tested for electromagnetic compatibility)
- Inspection Certificate with Calibration Report optionally available
- Display can be reversed for right and left hand use



Subject to change without notice.







## Model ET

With ball-bearing mounted,  
V-grooved guide rollers

### Available Models

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration** with running filament approx. 100 m/min
<b>ETB-100</b> <b>ETX-100</b>	0.5 - 100.0	24	PA: 0.20 mm Ø
<b>ETB-200</b> <b>ETX-200</b>	2 - 200	24	PA: 0.20 mm Ø
<b>ETB-500</b> <b>ETX-500</b>	2 - 500	24	PA: 0.20 mm Ø

\* Outer distance between outside guide rollers

\*\* Suitable for 95 % of applications (see also chart on page 11)

PA = Polyamide Monofilament

### Guide Rollers

V-grooved	Line Speed $v_{max}$ ... m/min	Roller Material
Standard	2000	Aluminium hard chromed

→ see page E →



fig. 2:  
Filament guide for easy  
material acquisition of  
running filaments

The two outer rollers can  
be tilted upwards using  
the lever on the rear side.  
If required, the filament  
guide can be unscrewed.



fig. 3:  
Models ETX and ETPX  
can be connected  
to PC for monitoring  
or downloading stored  
data (see page C9)

MEMORY MODE L			
Pos : 1	Pos : 2	Pos : 3	
AVG : 12.0	AVG : 16.3	AVG : 17.2	
Last : 22.1	Last : 12.8	Last : 15.1	
MAX : 22.1	MAX : 22.9	MAX : 22.7	
MIN : 5.4	MIN : 12.3	MIN : 13.8	
MAXPEAK : 28.1	MAXPEAK : 26.5	MAXPEAK : 26.3	
MINPEAK : 1.8	MINPEAK : 10.5	MINPEAK : 10.9	
Values : 10	Values : 10	Values : 10	
10.8	14.2	14.1	
10.0	19.4	14.1	
7.3	22.9	19.0	
6.1	17.3	22.7	
5.4	12.3	18.9	
9.2	13.4	14.3	
13.4	17.0	16.8	
17.4	19.5	18.4	
19.0	15.1	19.8	
22.1	12.8	13.8	
		15.1	

## Model ETP

With ceramic pins for line  
speeds up to  $v_{max}$  6000 m/min

### Available Models

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration** with running filament approx. 60 m/min
<b>ETPB-100</b> <b>ETPX-100</b>	0.5 - 100.0	22	PA: 0.20 mm Ø
<b>ETPB-200</b> <b>ETPX-200</b>	2 - 200	22	PA: 0.20 mm Ø
<b>ETPB-500</b> <b>ETPX-500</b>	2 - 500	22	PA: 0.20 mm Ø

\* Outer distance between outside ceramic pins

\*\* Suitable for 95 % of applications (see also chart on page 11)

PA = Polyamide Monofilament

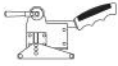
### Guide Pins

V-grooved	Line Speed $v_{max}$ ... m/min	Pin Material
Standard	6000	Aluminium-oxide ceramic

→ see page E →

### Specifications

	Models ETB, ETPB, ETX, ETPX
Calibration:	According to SCHMIDT factory procedure
Accuracy:	$\pm 0.5\%$ FS* und $\pm 1$ Digit typical $\pm 0.5\%$ FS*
Units	cN or g
Overrange (approx.):	10% FS*, without accuracy guarantee
Overload protection:	200% FS*
Measuring principle:	Strain gauge bridge
Measuring roller deflection:	0.5 mm max.
Signal processing:	Digital, 24 bit A/D converter
Damping:	adjustable electronic damping (Moving averaging)
Sampling rate:	approx. 1 kHz (Internal only)
Display update time:	2 times/sec
Display:	LCD 4 digit, 11 mm high (back-lit)
Memory:	LAST, AVG, MAX, MIN, PEAK-MIN, PEAK-MAX
Temperature range:	10 - 45 °C
Air humidity:	85% RH, max.
Power supply:	LiPo accumulator (60 h continuous use, charging time 3 ½ h) and mains adapter 100 - 240 VAC, 3 adapters (EU, US, UK)
Housing material:	Aluminium frame profile with plastic outer casing (PVC)
Housing dimensions:	197 x 58 x 47 mm (L x W x H)
Weight, net (gross):	approx. 340 g (1250 g)
* FS = Full Scale	
<b>Models ETX and ETPX additional:</b>	
Output signal digital:	USB
Memory:	max. 4000 values
Communication frequency:	max. 100 readings/sec



## Model KXE

2 Tension ranges from  
0.50 - 20.00 daN to 0.5 - 50.0 daN

### Special features:

- + Portable measuring head with 100 mm roller width to measure yarn groups of 50 mm width
- + The sensor can easily be engaged or disengaged also while the machine is running
- + Measurements can be made over the total width of the loom
- + 4 different memory modes can be selected by the operator
- + Storage of AVG, LAST, MIN, MAX, PEAK-MIN and PEAK-MAX tension values during an operator set measuring period
- + Adjustable electronic damping for better reading when tension is constantly changing
- + Output signal: digital USB
- + Delivery includes: tension meter, USB cable, and software »Tension Inspect 3«

### Standard features:

- LiPo accumulator
- Inspection Certificate with Calibration Report optionally available
- Apart from that the instrument relates to model ETX

### Available Models

MODEL	Tension Ranges daN	SCHMIDT Calibration Material
<b>KXE-20K</b>	0.50 - 20.00	fabric tape
<b>KXE-50K</b>	0.5 - 50.0	fabric tape

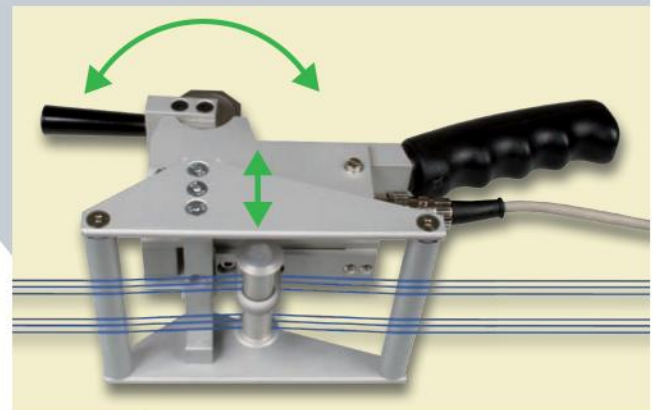
### Specifications

	Model KXE (measuring head)
Measuring Rollers:	2 x 22 mm ball bearing mounted rollers total 50 mm
Width of outer rollers:	100 mm, ball bearing mounted
Frame height adjustment:	24 mm
Housing material:	Anodized aluminium
Dimensions frame:	108 x 138 mm
Weight, net:	approx. 1000 g

Tension meter for measuring the tension of warp threads on out of operation and running weaving machines

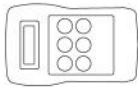


Model KXE-20K



Swivel the lever in direction to the handle to move the measuring roller downwards. Hold the measuring head over the yarn group, so that it runs parallel to the measuring feeler and the support rollers. Shove the measuring roller through the yarn group, turn the measuring head by 90° and swivel the lever forwards, to upward the measuring roller in measuring position.





# RTM SERIES

Tension range from 10 - 800 Hz

Belt tension meter (Trummeter) to determine the static tension of flat, V and ribbed belts or pretensioned ropes

### Special features:

- + The readings can be displayed as frequency (Hz) or strand force (N or lbf)
- + The belt tension meter includes a display unit as well as a plug in probe for one-hand operation and a probe with cable for limited access space
- + Measuring principle: red LED light source to determine vibration in Hz
- + Readings unaffected by nearby magnetic fields or noise
- + For determining the spring force in Newton, 2 parameters are needed. Thereby the following restrictions are obtained:
  - free strand length 9.99 m
  - belt mass up to 9.999 kg/m
- + Display menu in several user selectable languages
- + Manufacturer's Calibration Report is included

### Standard features:

- Battery operated
- Easy and save operation
- Rugged, compact plastic housing
- Microprocessor controlled
- Measurement with highest precision

### Available Models

MODEL

Measuring Range  
CN

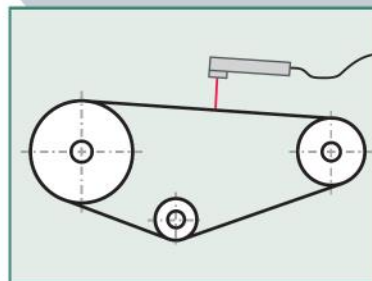
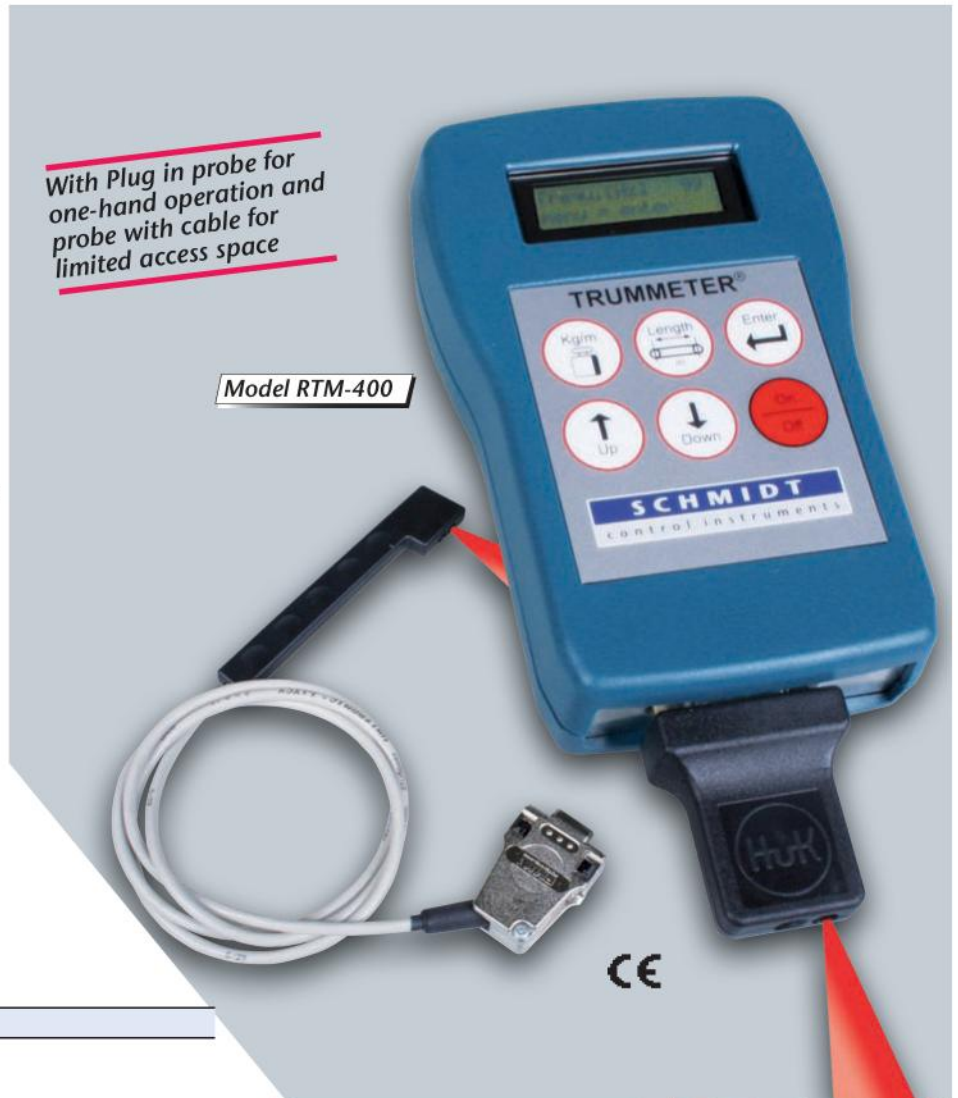
**RTM-400** 10 - 800 Hz

### Specifications

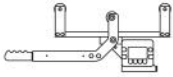
Measuring range:	10 - 800 Hz
Indicator error:	± 1 Hz
Total error:	< 5%
Display:	LCD
Measuring units:	N or lb, Hz
Sensing distance:	3 - 20 mm (recommended)
Temperature ranges:	+10 °C up to +50 °C
Power supply:	9 V battery
Housing:	Plastic (ABS)
Dimensions:	126 x 80 x 37 (LxWxH)
Weight, net (gross):	170 g (660g)

With Plug in probe for one-hand operation and probe with cable for limited access space

Model RTM-400



The instrument measures the natural frequency of a taut belt and displays the frequency in Hertz or tension in Newton. For measuring the non-moving belt must be tapped to oscillate.



Cable tension meter to measure the tension of pretensioned, non-moving ropes, cables, tower guy wires, zip lines, overhead lines, elevator ropes etc. up to 25.4 mm Ø

## Model CTM

2 Tension ranges up to 10 kN and 45 kN

### Special features:

- + For rope diameters from 4.75 - 25.4 mm
- + Depending to the wire Ø a suitable guide roller must be used
- + Changeable units kN, lbf, kgf
- + Easy to use - load cell and display integrated in one housing
- + The tension reading is quickly shown in the display, no conversion sheets are required
- + Large, easy to read LCD display with backlight
- + Calibration for one rope is free of charge; up to 20 calibrations of unique wire size and types can be stored
- + RS 232 interface for data transfer to PC
- + Internal memory. Readings can be transferred to a PC after finishing the work

### Standard features:

- Portable and rugged - designed for outdoor use
- For quick checks – easy to use
- CE approved
- Battery operation



### Calibration:

The calibration for one sample is free of charge, more will be charged. For calibration send us product details as kind of material, diameter and construction dimensions. If we do not have the rope ourself available we need 5 m sample wire from you.



Available Models	Tension Ranges		Tension Ranges	
	kN	lbf	kgf	
<b>CTM-2000</b>	10	2000	1000	
<b>CTM-10000</b>	45	10000	4500	

### Specifications

#### Model CTM

Measuring range:	up to 45 kN
Accuracy:	± 3% FS* calibrated to specific wire specimen
Measuring unit:	N, lbf, kgf switchable
Loading error:	Rope elongation of only 2 mm
Material diameter:	4.75 - 25.4 mm
Display:	LCD 25 mm high, full text prompts
Number of calibrations:	Up to 20 calibrations can be stored
Memory	Saves readings for a later data transfer to PC
Output signal:	2 Batteries, size AA
Temperature range:	-20 °C up to +60 °C
Dimensions:	61 x 24 x 8 cm (L x W x H)
Weight, net (gross):	approx. 5.7 kg (approx. 9.5 kg)

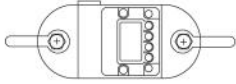
\*FS = full scale

### Guide Rollers

U-grooved	Rope Diameter	
	mm	inch
<b>CTM-SH-L</b>	4.75 - 6.35	3/16 - 1/4
<b>CTM-SH-P</b>	4.75 - 12.7	3/16 - 1/2
<b>CTM-SH-S</b>	6.35 - 19.05	1/4 - 3/4
<b>CTM-SH-T</b>	12.7 - 25.4	1/2 - 1

Delivery includes one roller set (as requested). Additional roller sets can be ordered optional





**Dynamometer - Crane Scale** to display the force between 2 attached shackles or to determine tension of pretensioned ropes or a rope with a suspended weight.

## Model EDJunior

4 Tension ranges up to 100 kN

### Special features EDJunior:

- + Changeable units N, lbf, kgf
- + Displays the actual tension force and saves a peak value
- + The tension reading is quickly shown in the display
- + Large, easy to read LCD display with backlight
- + IP 55 protected
- + Rugged housing made of NL 2024 aluminium alloy (EDJR-1T, EDJR-2T and EDJR-5T) or E4340 steel alloy (EDJR-10T)
- + Manufacturer's Calibration Report is included

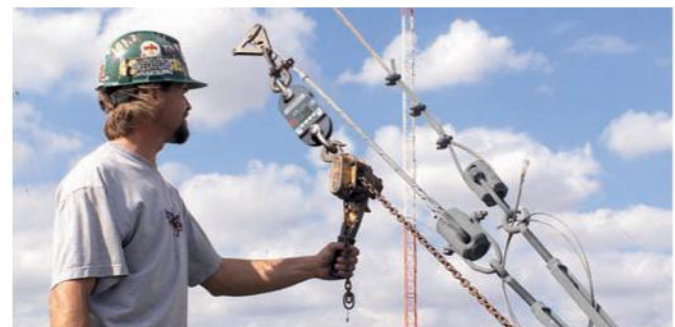
Available Models	Tension Ranges		
	kN	lbf	kgf
<b>EDJR-1T</b>	10	2500	1000
<b>EDJR-2T</b>	20	5000	2000
<b>EDJR-5T</b>	50	10000	5000
<b>EDJR-10T</b>	100	25000	10000



Model EDJR-2T



Specifications	Model EDJunior
Measuring range:	up to 100 kN
Accuracy:	0.2% full scale
Repeatability:	0.2% full scale
Proof Load:	150% full scale
Overload protection:	200% full scale
Display:	LCD 26 mm high, full text prompts
Anzeigeintervall:	2 times / sec
Power supply:	2 Batteries, size C
Temperature range:	-20°C up to 60°C



## Model CTME

The tension meter CTME provides a quick and easy way to accurately measure and display all of the elevator traction cable tensions in a set while the tension on a single cable is being adjusted. The digital display also shows the average tension of a set with max. 16 cables, as well as the total tensile load.



Model CTME

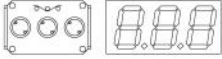
### Elevator cable tension meter

Ask for additional information

Specifications	Model CTME
Measuring range:	45 kN / 10000 lb / 4500 kg
Accuracy:	± 3% full scale for calibrated ropes ± 5% full scale for ropes with same Ø and different composition
Standard calibration:	3 ropes 8 x 19 with diameters 1/2", 9/16" and 5/8"
Additional calibrations:	Max. 5 ropes

other specifications same as model CTM

Subject to change without notice.



Continuous measurement  
and data logging

# Online Tension Measuring Systems

Depending on the application, SCHMIDT online tension sensors can be supplied on it's own or as part of a complete system:

## A Tension System 3-Roller Sensor only

- + For use with customer supplied indicators and closed loop control units  
or
- + Customer must supply regulated DC power source
- Customer Signal Processing:  
for example closed loop control



Analog output  
0-1V DC  
(standard)  
0-10V, 4-20mA,  
mV/V (optional)

0001...0010  
0100...1000  
0001...0010

Digital output  
RS 232, RS 422,  
USB or Wi-Fi  
(optional)



### Software (optional equipment):

»Tension Inspect 3« (WIN XP and higher)

The series TS and FS can be used for continuous tension monitoring. The sensor can be connected using RS 232, RS 422, USB or Wi-Fi to a PC.

The readings of max. 24 sensors can be transferred as real time values to a PC, displayed and stored as a CSV file using the program »Tension Inspect 3«. (see page C9)

## B Complete Tension System 3-Roller Sensor only

- + Sensor and display unit provide continuous tension readings
- + The analog output signal can be used for recording and control purposes
- Customer Signal Processing:  
for example closed loop control



Analog output  
0-10V DC  
(standard)



Digital output  
RS 232 or RS 422  
(optional)

0001...0010  
0100...1000  
0001...0010



## C Tension System 1-Roller Sensor only

- + Replacing an existing reversing point
- + External amplifier with analog outputs
- + Available with guide roller
- Customer Signal Processing:  
for example closed loop control



Analog output  
0-1V DC (standard)  
0-10V DC, 4-20mA or  
mV/V (optional)

0001...0010  
0100...1000  
0001...0010

Digital output  
RS 232, RS 422,  
USB or Wi-Fi (optional)

We provide the best solution. Please contact our technical department to discuss your applications.

**1<sup>st</sup>**  
IN TENSION  
METERS  
WORLDWIDE®

### SCHMIDT Online Sensors and Indicators:

For the continuous measurement of the running line tensions of threads and yarns, wires, cables, optic and carbon fibers and similar materials, SCHMIDT offers a wide variety of sensors using different guide rollers and frontplate dimensions.

#### Measuring principle 3-Roller Tension System:

3-roller measuring system, consisting of two outer guide rollers and a middle measuring roller. The tension of the measured material slightly deflects the measuring roller.

This deflection (up to 0.5 mm) is measured by a load cell. The built-in amplifier then generates an analog output signal which is proportional to the measured tension.

#### Measuring principle 1-Roller Tension System:

In combination with 2 outer reference guiding points the sensor builds a force triangle. The entry and exit angle must be constant. The sensor uses strain gauges and supplies an output signal in V or mV.

### Main Features:

- + Real time tension display (tension and time)
- + Long time recording using operator set time span
- + Adjustable sampling rate
- + Analyzing and printing of all stored data with time (graphs and numeric report)





# TS SERIES

Sensors for many applications

Universal sensor for continuous measurement



Model TS1-200

Model TS1-5000

### Special features:

- + Best accuracy  $\pm 1\%$  FS (Full Scale)
- + Various output signals, analog or digital
- + Mechanical overload protection
- + Easy calibration by operator
- + With or without integrated amplifier
- + Wide variety of custom designed sensors are available

### Standard features:

- Ball-bearing mounted, V-grooved guide rollers
- Rugged aluminium housing
- Power supply: +15 ... 24 V DC (1-phase, regulated)
- Inspection Certificate with Calibration Report optionally available

**Specifications** → see page D14 →

Special calibration using customer supplied samples is available:  
Please supply a sample of at least 5 m in length.

Universal online tension sensor for yarns, fibers, thin wires, etc.

## Model TS1

10 Tension ranges from 0-50 cN to 0-50 daN

### Available Models

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration Material**
<b>TS1-50</b>	0-50	64	PA: 0.12 mm Ø
<b>TS1-100</b>	0-100	64	PA: 0.12 mm Ø
<b>TS1-200</b>	0-200	64	PA: 0.12 mm Ø
<b>TS1-500</b>	0-500	64	PA: 0.20 mm Ø
<b>TS1-1000</b>	0-1000	64	PA: 0.30 mm Ø
<b>TS1-2000</b>	0-2000	124	PA: 0.50 mm Ø
<b>TS1-5000</b>	0-5000	124	PA: 0.80 mm Ø
<b>TS1-10K</b>	0-10 daN	124	PA: 1.00 mm Ø
<b>TS1-20K</b>	0-20 daN	224	PA: 1.50 mm Ø
<b>TS1-50K</b>	0-50 daN	224	Steelrope 1.50 mm Ø

Other tension ranges and measuring head widths available on request.

Other units of measure available – g or kg.

\* Outside dimensions of front plate

\*\* Suitable for 95% of applications (see also chart on page 11)

PA = Polyamide Monofilament

### Guide Rollers

	Line Speed $v_{max}$ ... m/min	Roller Material
<b>V-grooved</b>		
<b>Standard</b>	2000	Hard-coated aluminium
<b>Code K</b>	3500	Hard-coated aluminium
<b>Code H</b>	5000	Plasma-coated aluminium (for Model TS1-100 and higher ranges)
<b>Code T</b>	1000	Plastic (POM) black
<b>Code W</b>	1000	Nickel-plated steel
<b>Code ST</b>	1000	Hardened steel
<b>Code B</b>	1000	Tempered steel for tire cord
<b>Code CE2</b>	1000	Aluminium ceramic-coated
<b>Code ASY</b>	1000	Hard-coated aluminium*
<b>Code ASYB</b>	1000	Tempered steel for tire cord*
asymmetrical groove		
<b>U-grooved</b>		
<b>Code U</b>	2000	Hard-coated aluminium*

→ see page E →

\* Measuring head width 124 mm  
for model TS1-500 and higher ranges

### Output Signal

<b>Standard</b>	Analog output signal 0-1 V DC
<b>Code A2</b>	Analog output signal 0-10 V DC
<b>Code A3</b>	Current output signal 4-20 mA
<b>Code A10</b>	Analog DMS output mV/without amplifier
<b>Code 232</b>	Output signal digital RS232, analog 0-1 V DC (Communication frequency max. 100 readings/sec) for model TS1-100 and higher

To place an order please indicate the complete model number, e.g.:

Model with tension range  
Code for guide rollers  
(if not standard)  
Code for output signal/  
power supply  
(if not standard)  
Complete Order No.

**TS1-1000** + **T** + **A3** = **TS1-1000-T-A3**



Special tension sensors with ceramic pins for yarns and fibers at high speed

## Model TSP

4 Tension ranges from 0-50 cN to 0-500 cN

For line speeds up to  $v_{max}$ . 6000 m/min



Model TSP-500

### Special features:

- + Non-rotating, exchangeable ceramic pins
- + Suitable only for yarns and fibers
- Apart from that the instrument relates to model TS1

### Available Models

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration** with running filament approx. 300 m / min
TSP-50	0-50	64	PA: 0.12 mm Ø
TSP-100	0-100	64	PA: 0.12 mm Ø
TSP-200	0-200	64	PA: 0.12 mm Ø
TSP-500	0-500	64	PA: 0.20 mm Ø

Other tension ranges and measuring head widths available on request.  
Other units of measure available, such as g.

\* Outside dimensions of front plate

\*\* Suitable for 95% of applications (see also chart on page 11)

PA = Polyamide Monofilament

### Guide Pins

	Line Speed $v_{max}$ ... m / min	Pin Material
Standard	6000	Aluminium-oxide ceramic 5.2 mm Ø

→ see page E →

**1<sup>st</sup>** IN TENSION METERS WORLDWIDE®

Special calibration using customer supplied samples is available:  
Please supply a sample of at least 5 m in length.

### Output Signal Power Supply Specifications

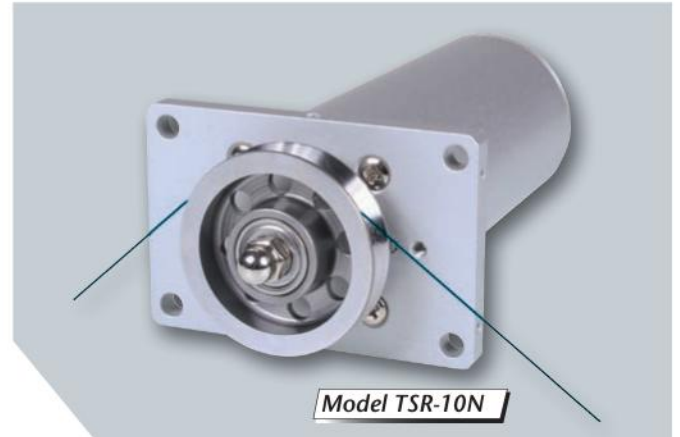
Models TSP and TSR same as Model TS1 (see page D2 and D14)

Tension sensor - single roller system - for installation at an existing deviating pulley

## Model TSR

5 Tension ranges from 0-10 N to 0-200 N

For thin wires and ropes



Model TSR-10N

### Special features:

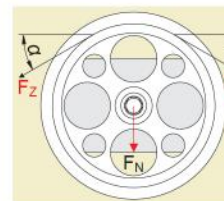
- + Entry angle and exit angle  $\alpha_{min}$  20° (must be constant)
- Apart from that the instrument relates to model TS1

### Available Models

MODEL	Nominal Load (Fn) N
TSR-10N	0-10
TSR-20N	0-20
TSR-50N	0-50
TSR-100N	0-100
TSR-200N	0-200

### Guide Rollers

V-grooved	Line Speed $v_{max}$ ... m / min	Roller Diameter mm	Roller Material → see page E →
Standard	4000	30	Hardened steel
Code R1	4000	30	Hard-chrome plated steel
Code F	4000	70	Hard-coated aluminium
Code FB	4000	70	Tempered steel
Code B6	2000	30	Hardened steel
Code B10	2000	30	Hardened steel



For determine the tension range, please send us the following information:

- Line tension  $F_z$
- In- and outcoming angle  $\alpha$
- Mounting position
- Desired guide roller
- Application





Tension sensor for flexible wire, cable, plastic tubing and other materials up to 8 mm Ø or 10 mm width

## Model TSH

6 Tension ranges from 0 - 1000 cN to 0 - 50.00 daN

Hardened guide rollers for heavy-duty applications and minimized material deflection



Model TSH-5000

### Special features:

- + Guide rollers 30 mm Ø, available with V- or U-groove
- Apart from that the instrument relates to model TS1

Available Models	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration Material**
------------------	----------------------	-----------------------------	--------------------------------

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration Material**
<b>TSH-1000</b>	0 - 1000	150	PA: 0.30 mm Ø
<b>TSH-2000</b>	0 - 2000	150	PA: 0.50 mm Ø
<b>TSH-5000</b>	0 - 5000	200	PA: 0.80 mm Ø
<b>TSH-10K</b>	0 - 10 daN	200	PA: 1.00 mm Ø
<b>TSH-20K</b>	0 - 20 daN	250	PA: 1.50 mm Ø
<b>TSH-50K</b>	0 - 50 daN	250	Steel rope 1.50 mm Ø (7x7x0.20)

Other tension ranges and measuring head widths available on request.

Other units of measure available, such as g.

\* Outside dimensions of front plate

\*\* Suitable for 95 % of applications (see also chart on page 11)

PA = Polyamide Monofilament

### Guide Rollers

Guide Rollers	Line Speed v <sub>max.</sub> ... m/min	Roller Material
<b>V-grooved</b>		
Standard	4000	Hardened steel (max. Ø 5 mm)
<b>U-grooved</b>		
Code R 1	4000	Hard chrome-plated steel (radius R5)
<b>flat</b>		
Code B6	2000	Hardened steel, width 6 mm
Code B10	2000	Hardened steel, width 10 mm

→ see page E →

Tension sensor for wires, ropes and cables up to max. 14 mm Ø

## Model TSW

3 Tension ranges from 0 - 20 daN to 0 - 100 daN

Big guide rollers 60 mm Ø, minimizes material deflection



Model TSW-100K

### Special features:

- + Guide rollers 60 mm Ø, available with V- or U-groove
- + Depending to the material to be measured the dimensions of the sensor can be modified
- Apart from that the instrument relates to model TS1

Available Models	Tension Ranges daN	Measuring Head Width* mm	SCHMIDT Calibration Material*
------------------	-----------------------	-----------------------------	-------------------------------

MODEL	Tension Ranges daN	Measuring Head Width* mm	SCHMIDT Calibration Material*
<b>TSW-20K</b>	0 - 20	550	steel rope 1.5 mm Ø (7x7x0.25)
<b>TSW-50K</b>	0 - 50	550	steel rope 1.5 mm Ø (6x7x0.30)
<b>TSW-100K</b>	0 - 100	550	steel rope 1.5 mm Ø (6x7x0.50)

Other tension ranges available on request.

Other units of measure available, such as g.

\* Outside dimensions of front plate

### Guide Rollers

Guide Rollers	Line Speed v <sub>max.</sub> ... m/min	Roller Material
<b>V-grooved</b>		
Standard	2000	Hard-coated aluminum max. wire diameter 5 mm
<b>U-grooved</b>		
Code R2	2000	Hard-coated aluminum (Radius R5)
Code R3	2000	Hard-coated aluminum (Radius R8)

→ see page E →

Special calibration using customer supplied samples is available: Please supply a sample of at least 5 m in length.

**Output Signal** **Power Supply** **Specifications** **Models TSH and TSW same as Model TS1** (see page D2 and D14)

To place an order please indicate the complete model number, e.g.:

Model with tension range  
Code for guide rollers (if not standard)  
Code for output signal/power supply (if not standard)  
Complete Order No.

**TSH-1000** + **R1** + **A3** = **TSH-1000-R1-A3**

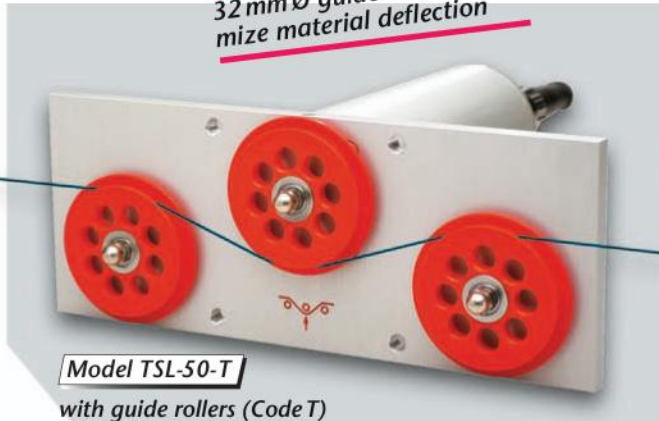


Special tension sensors feature large rollers to minimize bending of materials like fiber optics, single carbon fibers and technical fibers etc.

## Model TSL

5 Tension ranges from 0 - 50 cN to 0 - 1000 cN

32 mm Ø guide rollers minimize material deflection



Model TSL-50-T

with guide rollers (Code T)

### Special features:

- + Gentle handling of sensitive material during measurement
- + Extremely light weight, low inertia guide rollers
- + Best suitable for low tension ranges
- Apart from that the instrument relates to model TS1

### Available Models

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration Material**
<b>TSL-50</b>	0 - 50	150	PA: 0.12 mm Ø
<b>TSL-100</b>	0 - 100	150	PA: 0.12 mm Ø
<b>TSL-200</b>	0 - 200	150	PA: 0.12 mm Ø
<b>TSL-500</b>	0 - 500	150	PA: 0.20 mm Ø
<b>TSL-1000</b>	0 - 1000	150	PA: 0.30 mm Ø

Other tension ranges and measuring head widths available on request.  
Other units of measure available, such as g.

\* Outside dimensions of front plate

\*\* Suitable for 95% of applications (see also chart on page 11)  
PA = Polyamide Monofilament

### Guide Rollers

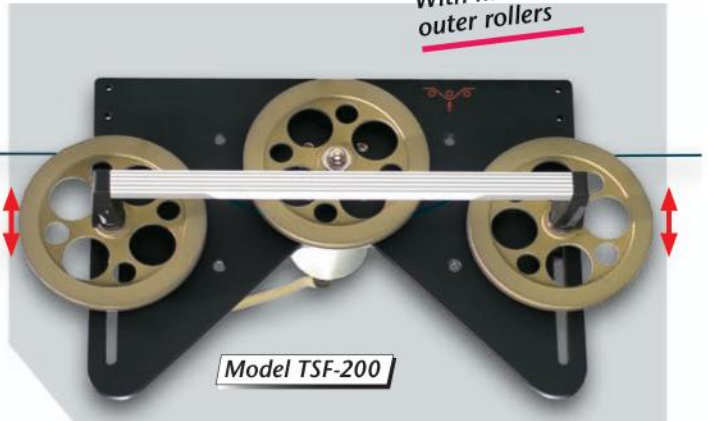
Guide Rollers	Line Speed $v_{max}$ ... m/min	Roller Material
<b>V-grooved</b>		
Standard	4000	Hard-coated aluminum
<b>U-grooved</b>		
Code T	4000	Plastic (PVC) red (same dimensions as standard roller)

→ see page E →

## Model TSF

6 Tension ranges from 0 - 100 cN to 0 - 5000 cN

With movable outer rollers



Model TSF-200

### Special features:

- + Large bending radius for gentle handling of sensitive material
- + Ball-bearing mounted, V-Grooved guide rollers with 70 mm Ø
- + The outer rollers can be moved downwards to minimize contact in case of non-measurements
- Apart from that the instrument relates to model TS1

### Available Models

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration Material**
<b>TSF-100</b>	0 - 100	270	PA: 0.12 mm Ø
<b>TSF-200</b>	0 - 200	270	PA: 0.12 mm Ø
<b>TSF-500</b>	0 - 500	270	PA: 0.20 mm Ø
<b>TSF-1000</b>	0 - 1000	270	PA: 0.30 mm Ø
<b>TSF-2000</b>	0 - 2000	270	PA: 0.50 mm Ø
<b>TSF-5000</b>	0 - 5000	270	PA: 0.80 mm Ø

Other tension ranges available on request.

Other units of measure available, such as g.

\* Outer distance between outside guide rollers

\*\* Suitable for 95% of applications (see also chart on page 11)  
PA = Polyamide Monofilament

### Guide Rollers

Guide Rollers	Line Speed $v_{max}$ ... m/min	Roller Material
<b>V-grooved</b>		
Standard	5000	Hard-coated aluminum

→ see page E →

Special calibration using customer supplied samples is available: Please supply a sample of at least 5 m in length.

**Output Signal** **Power Supply** **Specifications** **Models TSL and TSF same as Model TS1** (see page D2 and D14)





Online sensors for continuous measuring of low or high tensions of textile ribbons, films, foils, fiber bunches etc.

**1<sup>st</sup>** IN TENSION METERS WORLDWIDE®

## Model TSB1

8 Tension ranges from 0 - 100 cN to 0 - 20 daN

Max. width of material to be measured 30 mm



**Model TSB1-500-20**

Version with 20 mm tape rollers

### Special features:

- + Dual-flanged outer guide rollers with various widths, from 7 mm to 30 mm
- + The roller width should correspond with the width of the material to be measured.
- Apart from that the instrument relates to model TS1

### Available Models

MODEL	Tension Ranges* cN	Measuring Head Width** mm	Roller Widths mm
<b>TSB 1-100</b>	0-100	60	7, 10, 15, 20
<b>TSB 1-200</b>	0-200	60	7, 10, 15, 20
<b>TSB 1-500</b>	0-500	60	7, 10, 15, 20
<b>TSB 1-1000</b>	0-1000	60	7, 10, 15, 20, 30
<b>TSB 1-2000</b>	0-2000	120	7, 10, 15, 20, 30
<b>TSB 1-5000</b>	0-5000	120	7, 10, 15, 20, 30
<b>TSB1-10K</b>	0-10 daN	120	7, 10, 15, 20
<b>TSB1-20K</b>	0-20 daN	220	7, 10, 15, 20

Other tension ranges and measuring head widths available on request.

Other units of measure available – g or kg.

\* SCHMIDT calibration material textile ribbon or film, depending on tension range and roller width

\*\* Outside dimensions of front plate

### Guide Rollers

Line Speed  
 $v_{max}$  ... m/min  
Roller Material

Standard	1000	Hard-coated aluminum, 13 mm Ø (Exception: 7 mm rollers are made of nickel-plated steel)
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Other roller materials (nickel-plated steel or plastic), as well as special coatings (anti adhesive or carbon fibres - NAV optimized) are available on request.

Special calibration using customer supplied samples is available: Please supply a sample of at least 5 m in length.

### Output Signal | Power Supply | Specifications

**Models TSB1 and TSB2 same as Model TS1** (see page D2 and D14)

To place an order please indicate the complete model number, e.g.:

Model with tension range  
Code for guide rollers (if not standard)  
Code for output signal/power supply (if not standard)  
Complete Order No.

**TSB1-1000** + **10** + **A3** = **TSB1-1000-10-A3**

## Model TSB2

8 Tension ranges from 0 - 500 cN to 0 - 100 daN

Cylindrical rollers with special supports for higher tension ranges



**Model TSB2-50K-50**

Version with 50 mm tape rollers

This model is custom-built to your specific application requirements.

Please submit the following details:

- Description of application
- Expected tension range
- Kind and dimensions of the material to be measured

### Available Models

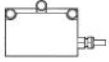
MODEL	Tension Ranges* cN	Roller Widths mm
<b>TSB 2-500</b>	0-500	20, 30, 36, 41, 50, 100
<b>TSB 2-1000</b>	0-1000	20, 30, 36, 41, 50, 100
<b>TSB 2-2000</b>	0-2000	20, 30, 36, 41, 50, 100
<b>TSB 2-5000</b>	0-5000	20, 30, 36, 41, 50, 100
<b>TSB 2-10K</b>	0-10 daN	15, 20, 30, 36, 41, 50, 100
<b>TSB 2-20K</b>	0-20 daN	15, 20, 30, 36, 41, 50, 100
<b>TSB 2-50K</b>	0-50 daN	15, 20, 30, 36, 41, 50, 100
<b>TSB 2-100K</b>	0-100 daN	15, 20, 30, 36, 41, 50, 100

Other tension ranges available on request.

Other units of measure available – g or kg.

\* SCHMIDT calibration material textile ribbon or film, depending on tension range and roller width

→ see page E →



## MZ SERIES

Online tension sensors for small tensions

### Special features:

- + Slim, compact housing, only 18 mm width
- + 2 different designs with different material path:  
MAZ series: gently material path above the 3 rollers  
MBZ series: material path warpping all 3 rollers
- + Integrated amplifier with various output signals

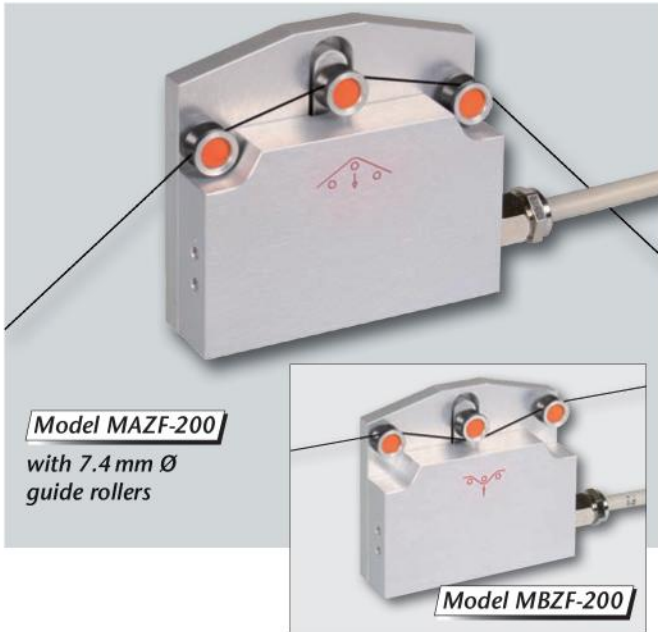
### Standard features:

- Aluminium housing
- Supplied with a 2 m shield cable

Compact sensor for  
continuous tension  
measurement

## Model MAZF, MBZF

3 Tension ranges from 0 - 100 cN to 0 - 500 cN



Model MAZF-200

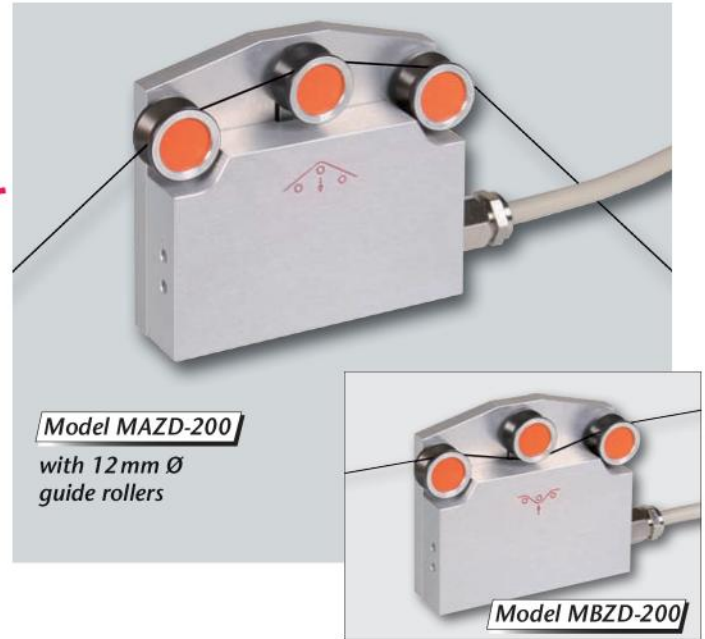
with 7.4 mm Ø  
guide rollers

Model MBZF-200

Tension sensor for yarns, fibers, textile ribbons,  
very fine wires, films, foils etc.

## Model MAZD, MBZD

3 Tension ranges from 0 - 100 cN to 0 - 500 cN



Model MAZD-200

with 12 mm Ø  
guide rollers

Model MBZD-200

## Model MBZB

3 Tension ranges from 0 - 100 cN to 0 - 500 cN



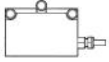
Model MBZB-200

with 10 mm tape rollers



Space saving mounting of MZ series by using an optional rail





**Model MAZF, MBZF, MAZD, MBZD**

**Available Models**

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration Material**
<b>MAZF-100 MBZF-100</b>	0-100	70	PA: 0.12 mm Ø
<b>MAZF-200 MBZF-200</b>	0-200	70	PA: 0.12 mm Ø
<b>MAZF-500 MBZF-500</b>	0-500	70	PA: 0.20 mm Ø
<b>MAZD-100 MBZD-100</b>	0-100	70	PA: 0.12 mm Ø
<b>MAZD-200 MBZD-200</b>	0-200	70	PA: 0.12 mm Ø
<b>MAZD-500 MBZD-500</b>	0-500	70	PA: 0.20 mm Ø
<b>MAZD-1000 MBZD-1000</b>	0-1000	70	PA: 0.30 mm Ø

Other units of measure available – g.

\* Outside dimensions of the housing

\*\* Suitable for 95% of applications (see also chart on page 11)

PA = Polyamide Monofilament

**Model MBZB**

**Available Models**

MODEL	Tension Ranges* cN	Measuring Head Width** mm	Roller Widths mm
<b>MBZB-100</b>	0-100	70	7, 10
<b>MBZB-200</b>	0-200	70	7, 10
<b>MBZB-500</b>	0-500	70	7, 10
<b>MBZB-1000</b>	0-1000	70	7, 10

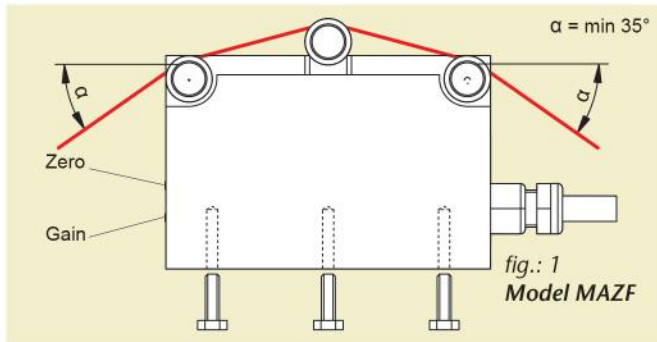
Other units of measure available – g.

\* SCHMIDT calibration material textile ribbon or film, depending on tension range and roller width

\*\* Outside dimensions of the housing

**Output Signal**

<b>Standard</b>	Analog output signal 0-1 V DC
<b>Code A2</b>	Analog output signal 0-10 V DC
<b>Code A10</b>	Analog DMS output signal mV/V without amplifier



**Guide Rollers**

**Model MAZF, MBZF**

V-grooved	Line Speed v <sub>max</sub> ... m/min	Roller Material
<b>Standard</b>	900	Hard-coated aluminium
<b>Code K</b>	2000	Hard-coated aluminium

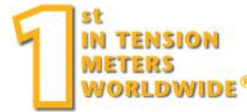
**Model MAZD, MBZD**

V-grooved	Line Speed v <sub>max</sub> ... m/min	Roller Material
<b>Standard</b>	2000	Hard-coated aluminium
<b>Code K</b>	3500	Hard-coated aluminium
<b>Code H</b>	5000	Plasma-coated aluminium

**Model MBZB**

<b>Standard</b>	1000	Hard-coated aluminium (Exception: 7 mm rollers are made of nickel-plated steel)
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Other roller materials (nickel-plated steel or plastic), as well as special coatings (anti-adhesive or carbon fibres - NAV optimized) are available on request.



Compact sensor for  
continuous tension  
measurement

**Specifications**

Calibration:	SCHMIDT factory procedure
Accuracy:	± 2% FS* and ± 1 Digit Other calibration material: ± 3% FS* or better
Overload protection:	100% FS*
Measuring principle:	Strain gauge bridge
Measuring roller deflection:	max. 0.5 mm
Signal processing:	analog
Output signal:	Standard: 0-1 V DC (analog) Option: 0-10 V DC, mV/V
Output:	Shielded cable (2 m) with bare leads
Damping (f <sub>g</sub> ):	Standard (analog): 30 Hz
Temperature drift:	better ± 0.05% FS*/°C
Temperature range:	10-45 °C
Air humidity:	85% RH, max.
Power supply:	+15 ... 24 V DC, 21 mA (regulated); Code A10: max. +5 V, max. 20 mA
Housing material:	Aluminium
Housing dimensions	70 x 55 x 17 mm (L x W x H)
Weight, net:	Approx. 100 g

\* FS = Full Scale

To place an order  
please indicate the complete model number, e.g.:

Model with tension range  
Code for guide rollers  
(if not standard)  
Code for output signal/  
power supply  
(if not standard)  
Complete Order No.  
**MAZF-500 + K + A2 = MAZF-500-K-A2**



# FS SERIES

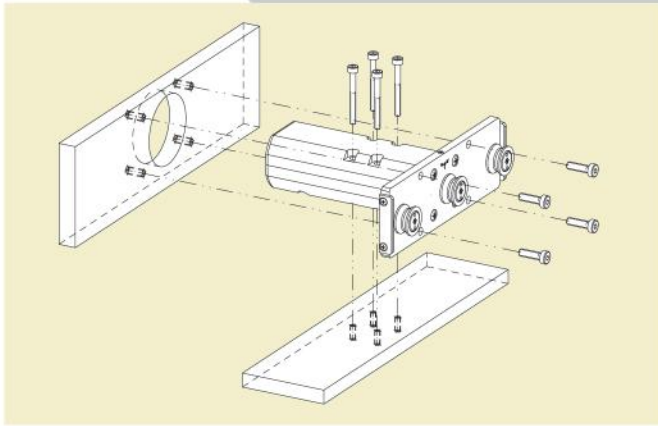
Economic sensor  
for many applications

Universal sensor for  
continuous measurements



### Special features:

- + Accuracy  $\pm 1.5\%$  full scale or better
- + Output signal: analog (voltage or current)  
digital (USB, RS 232, RS 422)
- + Mechanical overload protection
- + Easy calibration by operator
- + Universal mounting possibility - easy to install housing,  
mounting or cylindrical hole mounting



### Standard features:

- Ball-bearing mounted, V-grooved guide rollers
- Rugged aluminium housing
- Power supply: + 15 ... 24 V DC (1-phase, regulated)
- Inspection Certificate with Calibration Report optionally available

**Specifications** → see page D14 →

Special calibration using customer supplied samples is available:  
Please supply a sample of at least 5 m in length.

Tension sensor for yarns, fibers and  
thin ropes

## Model FS1

10 Tension ranges from 0-50 cN to 0-50 daN

Available Models	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration Material**
<b>FS1-50</b>	0-50	64	PA: 0.12 mm Ø
<b>FS1-100</b>	0-100	64	PA: 0.12 mm Ø
<b>FS1-200</b>	0-200	64	PA: 0.12 mm Ø
<b>FS1-500</b>	0-500	64	PA: 0.20 mm Ø
<b>FS1-1000</b>	0-1000	64	PA: 0.30 mm Ø
<b>FS1-2000</b>	0-2000	124	PA: 0.50 mm Ø
<b>FS1-5000</b>	0-5000	124	PA: 0.80 mm Ø
<b>FS1-10K</b>	0-10 daN	124	PA: 1.00 mm Ø
<b>FS1-20K</b>	0-20 daN	224	PA: 1.50 mm Ø
<b>FS1-50K</b>	0-50 daN	224	Steelrope 1.50 mm Ø

Other tension ranges and measuring head widths available on request.  
Other units of measure available - g or kg.

\* Outside dimensions of front plate

\*\* Suitable for 95% of applications (see also chart on page 11)

PA = Polyamide Monofilament

### Guide Rollers

V-grooved	Line Speed $v_{max}$ ... m/min	Roller Material	→ see page E →
<b>Standard</b>	2000	Hard-coated aluminium	
<b>Code K</b>	3500	Hard-coated aluminium	
<b>Code H</b>	5000	Plasma-coated aluminium (for Model FS 1-100 and higher ranges)	
<b>Code T</b>	1000	Plastic (POM) black	
<b>Code W</b>	1000	Nickel-plated steel	
<b>Code ST</b>	1000	Hardened steel	
<b>Code B</b>	1000	Tempered steel for tire cord	
<b>Code CE2</b>	1000	Aluminium ceramic-coated	
<b>Code ASY</b>	1000	Hard-coated aluminium*	
<b>Code ASYB</b>	1000	Tempered steel for tire cord*	

### U-grooved

<b>Code U</b>	2000	Hard-coated aluminium*
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\* Measuring Head Width 124 mm  
for Model FS1-500 and higher ranges

### Output Signal

<b>Standard</b>	Analog output signal 0-1 V DC
<b>Code A2</b>	Analog output signal 0-10 V DC
<b>Code A3</b>	Current output signal 4-20 mA
<b>Code 422*</b>	Output signal digital RS 422
<b>Code USB*</b>	Output signal digital USB
<b>Code 232*</b>	Output signal digital RS 232
<b>Code WL*</b>	Output signal digital wireless

\* for model FS1-100 and higher - more Information see page D13 - 14



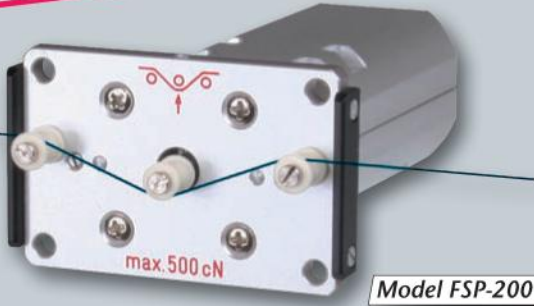


Special tension sensor with ceramic pins for yarns and fibers at high speed

## Model FSP

5 Tension ranges from 0 - 50 cN to 0 - 1000 cN

For line speeds up to  $v_{max}$ . 6000 m/min



Model FSP-200

### Special features:

- + Non-rotating, exchangeable ceramic pins
- + Suitable only for yarns and fibers
- Apart from that the instrument relates to FS1

### Available Models

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration** with running filament approx. 300 m/min
<b>FSP-50</b>	0 - 50	64	PA: 0.12 mm Ø
<b>FSP-100</b>	0 - 100	64	PA: 0.12 mm Ø
<b>FSP-200</b>	0 - 200	64	PA: 0.12 mm Ø
<b>FSP-500</b>	0 - 500	64	PA: 0.20 mm Ø
<b>FSP-1000</b>	0 - 1000	64	PA: 0.30 mm Ø

Other tension ranges and measuring head widths available on request.  
Other units of measure available, such as g.

\* Outside dimensions of front plate

\*\* Suitable for 95% of applications (see also chart on page 11)  
PA = Polyamide Monofilament

### Guide Pins

	Line Speed $v_{max}$ . ... m/min	Pin Material
<b>Standard</b>	6000	Aluminium-oxide ceramic 5.2 mm Ø

→ see page E →

**1<sup>st</sup>** IN TENSION METERS WORLDWIDE®

Tension sensor for flexible wire, cable, plastic tubing and other materials up to 8 mm Ø or 10 mm width

## Model FSH

6 Tension ranges from 0 - 1000 cN to 0 - 50.00 daN

Hardened guide rollers for heavy-duty applications and minimized material deflection



Model FSH-5000

### Special features:

- + Guide rollers 30 mm Ø, available with V- or U-groove
- + For custom designs contact our technical department.
- Apart from that the instrument relates to FS1

### Available Models

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration**
<b>FSH-1000</b>	0 - 1000	150	PA: 0.30 mm Ø
<b>FSH-2000</b>	0 - 2000	150	PA: 0.50 mm Ø
<b>FSH-5000</b>	0 - 5000	200	PA: 0.80 mm Ø
<b>FSH-10K</b>	0 - 10 daN	200	PA: 1.00 mm Ø
<b>FSH-20K</b>	0 - 20 daN	250	PA: 1.50 mm Ø
<b>FSH-50K</b>	0 - 50 daN	250	Steelrope 1.50 mm Ø (7 x 7 x 0.20)

Other tension ranges and measuring head widths available on request.  
Other units of measure available, such as g.

\* Outside dimensions of front plate

\*\* Suitable for 95% of applications (see also chart on page 11)  
PA = Polyamide Monofilament

### Guide Rollers

	Line Speed $v_{max}$ . ... m/min	Roller Material
<b>V-grooved</b>		
<b>Standard</b>	4000	Hardened steel (max. Ø 5 mm)
<b>U-grooved</b>		
<b>Code R1</b>	4000	Hard chrome-plated steel (radius R5)
<b>flat</b>		
<b>Code B6</b>	2000	Hardened steel, width 6 mm
<b>Code B10</b>	2000	Hardened steel, width 10 mm

→ see page E →

Special calibration using customer supplied samples is available: Please supply a sample of at least 5 m in length.

**Output Signal** **Power Supply** **Specifications** **Models FSP and FSH same as Model FS1** (see page D9 and D14)

To place an order please indicate the complete model number, e.g.:

Model with tension range  
Code for guide rollers (if not standard)  
Code for output signal / power supply (if not standard)  
Complete Order No.

**FSH-1000** + **U** + **A3** = **FSH-1000-U-A3**

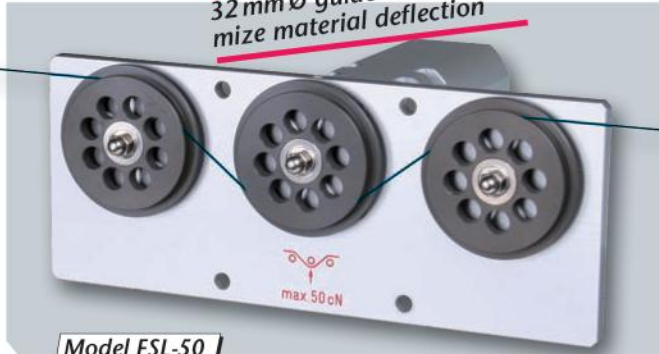


Tension sensor for minimal bending of materials like fiber optics, carbon and technical fibers

## Model FSL

5 Tension ranges from 0 - 50 cN to 0 - 1000 cN

32 mm Ø guide rollers minimize material deflection



Model FSL-50

### Special features:

- + Gentle handling of sensitive material during measurement
- + Extremely light weight, low inertia guide rollers
- + Best suitable for low tension ranges
- Apart from that the instrument relates to model FS1

### Available Models

MODEL	Tension Ranges cN	Measuring Head Width* mm	SCHMIDT Calibration Material**
<b>FSL-50</b>	0-50	150	PA: 0.12 mm Ø
<b>FSL-100</b>	0-100	150	PA: 0.12 mm Ø
<b>FSL-200</b>	0-200	150	PA: 0.12 mm Ø
<b>FSL-500</b>	0-500	150	PA: 0.20 mm Ø
<b>FSL-1000</b>	0-1000	150	PA: 0.30 mm Ø

Other tension ranges and measuring head widths available on request.

Other units of measure available, such as g.

\* Outside dimensions of front plate

\*\* Suitable for 95% of applications (see also chart on page 11)

PA = Polyamide Monofilament

### Guide Rollers

#### V-grooved

	Line Speed $v_{max}$ ... m/min	Roller Material
<b>Standard</b>	4000	Hard-coated aluminum
<b>Code T</b>	4000	Plastic (PVC) red (same dimensions as standard roller)

→ see page E →

Tension sensor for textile ribbons, films, foils, fiber bunches etc.

## Model FSB1

8 Tension ranges from 0 - 100 cN to 0 - 20 daN

Max. width of material to be measured 30 mm



Model FSB1-500-20

Version with 20 mm tape rollers

### Special features:

- + Dual-flanged outer guide rollers with various widths, from 7 mm to 30 mm
- + The roller width should correspond with the width of the material to be measured.
- Apart from that the instrument relates to model FS1

### Available Models

MODEL	Tension Ranges* cN	Measuring Head Width** mm	Roller Widths mm
<b>FSB1-100</b>	0-100	60	7, 10, 15, 20
<b>FSB1-200</b>	0-200	60	7, 10, 15, 20
<b>FSB1-500</b>	0-500	60	7, 10, 15, 20
<b>FSB1-1000</b>	0-1000	60	7, 10, 15, 20, 30
<b>FSB1-2000</b>	0-2000	120	7, 10, 15, 20, 30
<b>FSB1-5000</b>	0-5000	120	7, 10, 15, 20, 30
<b>FSB1-10K</b>	0-10 daN	120	7, 10, 15, 20
<b>FSB1-20K</b>	0-20 daN	220	7, 10, 15, 20

Other tension ranges and measuring head widths available on request.

Other units of measure available – g or kg.

\* SCHMIDT calibration material textile ribbon or film,

depending on tension range and roller width

\*\* Outside dimensions of front plate

### Guide Rollers

#### Standard

	Line Speed $v_{max}$ ... m/min	Roller Material
<b>Standard</b>	1000	Hard-coated aluminum, 13 mm Ø (Exception: 7 mm rollers are made of nickel-plated steel)

→ see page E →

Other roller materials (nickel-plated steel or plastic), as well as special coatings (ceramic, anti adhesive or carbon fibres - NAV optimized) are available on request.

Special calibration using customer supplied samples is available: Please supply a sample of at least 5 m in length.

**Output Signal** **Power Supply** **Specifications** **Models FSL and FSB1 same as Model FS1** (see page D9 and D14)





Tension sensor - single roller system - for installation at an existing deviating pulley

## Model FSR

5 Tension ranges from 0 - 10 N to 0 - 200 N

For thin wires and ropes



Model FSR-10N

### Special features:

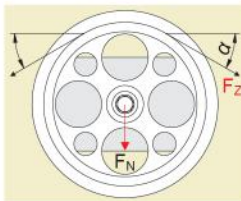
- + Entry angle and exit angle  $\alpha_{\min} 20^\circ$  (must be constant)
- Apart from that the instrument relates to model FS1

### Available Models

MODEL	Nominal Load $F_N$ N
<b>FSR-10N</b>	0 - 10
<b>FSR-20N</b>	0 - 20
<b>FSR-50N</b>	0 - 50
<b>FSR-100N</b>	0 - 100
<b>FSR-200N</b>	0 - 200

### Guide Rollers

V-grooved	Line Speed $v_{\max}$ ... m/min	Roller Diameter mm	Roller Material → see page E →
<b>Standard</b>	4000	30	Hardened steel
<b>Code R1</b>	4000	30	Hard-chrome plated steel
<b>Code F</b>	4000	70	Hard-coated aluminium
<b>Code FB</b>	4000	70	Tempered steel
<b>Code B6</b>	2000	30	Hardened steel
<b>Code B10</b>	2000	30	Hardened steel



For determine the tension range, please send us the following information:

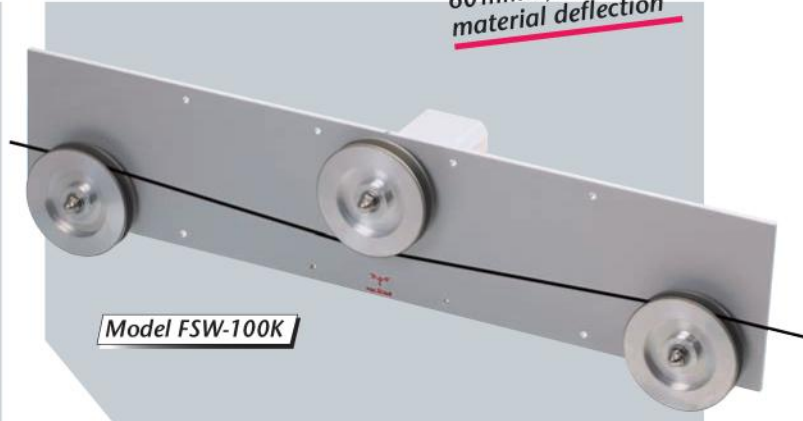
- Line tension  $F_z$
- In- and outcoming angle  $\alpha$
- Mounting position
- Desired guide roller
- Application

Tension sensor for wires, ropes and cables up to max. 10 mm  $\varnothing$

## Model FSW

3 Tension ranges from 0 - 20 daN to 0 - 100 daN

Big guide rollers 60 mm  $\varnothing$ , minimizes material deflection



Model FSW-100K

### Special features:

- + Guide rollers 60 mm  $\varnothing$ , available with V- or U-groove
- + Depending to the material to be measured the dimensions of the sensor can be modified
- Apart from that the instrument relates to model FS1

### Available Models

MODEL	Tension Ranges daN	Measuring Head Width* mm	SCHMIDT Calibration Material*
<b>FSW-20K</b>	0 - 20	550	steel rope 1.5 mm $\varnothing$ (7x7x0.25)
<b>FSW-50K</b>	0 - 50	550	steel rope 1.5 mm $\varnothing$ (6x7x0.30)
<b>FSW-100K</b>	0 - 100	550	steel rope 1.5 mm $\varnothing$ (6x7x0.50)

Other tension ranges available on request.  
Other units of measure available, such as g.  
\* Outside dimensions of front plate

### Guide Rollers

V-grooved	Line Speed $v_{\max}$ ... m/min	Roller Material
<b>Standard</b>	2000	Hard-coated aluminum max. wire diameter 5 mm
<b>U-grooved</b>		
<b>Code R2</b>	2000	Hard-coated aluminum (Radius R5)
<b>Code R3</b>	2000	Hard-coated aluminum (Radius R8)

Special calibration using customer supplied samples is available:  
Please supply a sample of at least 5 m in length.

**Output Signal** **Power Supply** **Specifications**

**Models FSR and FSW same as Model FS1** (see page D9 and D14)

To place an order please indicate the complete model number, e.g.:

Model with tension range  
Code for guide rollers (if not standard)  
Code for output signal/power supply (if not standard)  
Complete Order No.

**FSR-100N** + **R1** + **A3** = **FSR-100N-R1-A3**



## Model FS-Digital

Digital output for all sensors of series FS

### A Special features Code USB:

- + USB output, max. 500 readings/sec
- + Output plug: socket USB typ B
- + No external power supply is required

### B Special features Code 232:

- + RS 232 output, max. 200 readings/sec
- + Output plug: socket Sub D9
- + External power supply + 15 ... 24 VDC required

### C Special features Code 422:

- + RS 422 output, communication frequency depending to the number of sensors connected, max. 200 readings/sec
- + To connect several sensors to a PC or one sensor over a long distance (max. 1000 m)
- + Up to 32 sensors with different design and range can be connected in series
- + Individual addressing of each sensor
- + Calibration by operator, analog adjustment
- + Control lamp shows readiness of working
- + External power supply + 15 ... 24 VDC required

### D Online tension sensor with Wi-Fi data communication

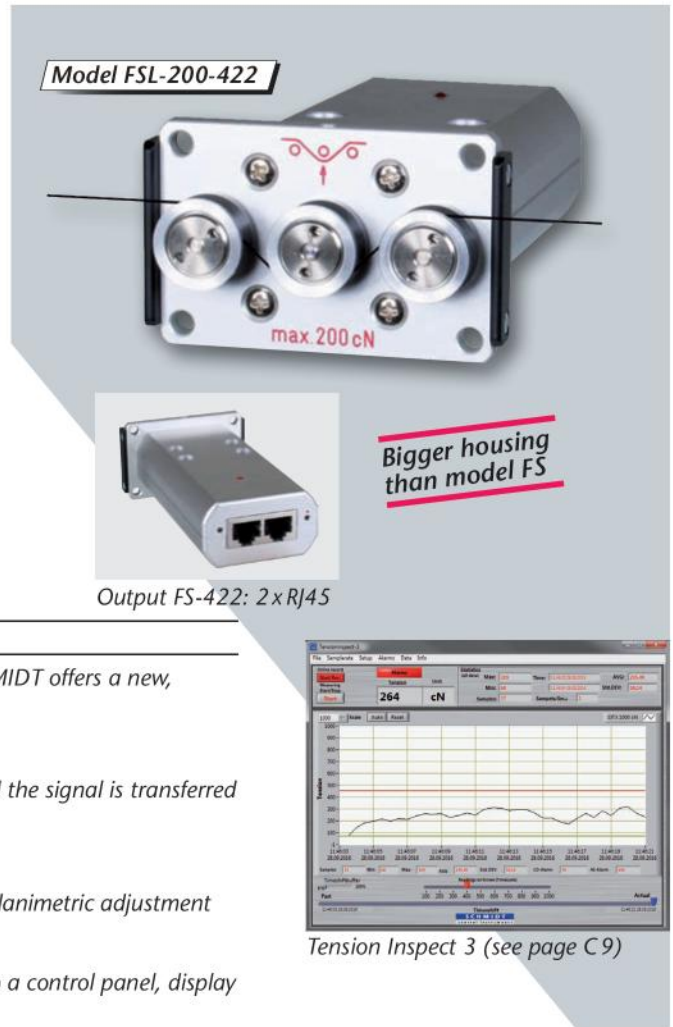
Wherever measuring values cannot be transferred using a cable, SCHMIDT offers a new, economic solution - Wi-Fi data communications

#### Typical applications:

- Machines, where a tension sensor is mounted on rotating parts and the signal is transferred using slip-rings now
- Process data acquisition in modern production process

#### Solution:

- For rotating applications we equip our online series FS with a new planimetric adjustment system. Therefor gravity forces can be compensated.  
**To clarify important parameters please contact us!**
- The integrated Wi-Fi modul ensures wireless data communication to a control panel, display or computer.



The digital output is available for all models for series FS: e. g. FS1-1000-422, FSH-5000-USB, FSL-200-232, FSB1-500-WL

### FS Digital - overview of connections

**A FS-USB:** Connection to a PC using the USB output.  
The readings can be displayed and stored with »Tension Inspect 3«



USB

**B FS-232:** Connection to a PC using the RS 232 output.  
The readings can be displayed and stored with »Tension Inspect 3«



RS 232

DC

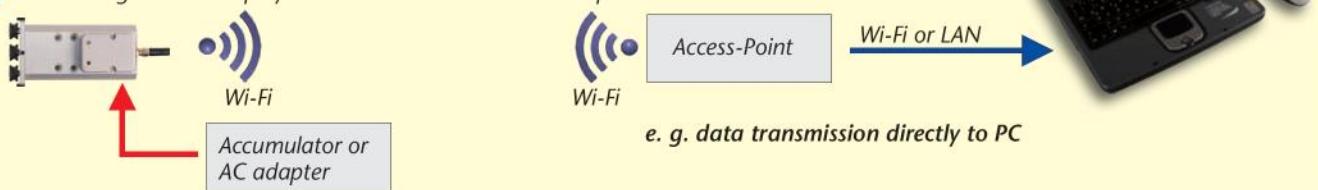




**C** **FS-422:** Connecting up to 32 sensors in series to a PC using RS 422 output.  
The readings can be displayed and stored with T»Tension Inspect 3«



**D** **FS-WL:** Connecting up to 8 sensors to a PC using Wi-Fi.  
The readings can be displayed and stored with »Tension Inspect 3«



**Online Sensors**

**TS SERIES**

**FS SERIES**

**Specifications**

Calibration:	According to SCHMIDT factory procedure	According to SCHMIDT factory procedure
Accuracy:	±1 % full scale and ±digit or Other calibration material: ± 3 % FS* or better	±1.5 % full scale and ±digit or Other calibration material: ± 3 % FS* or better
Overload protection:	100 % FS*	100 % FS*
Measuring principle:	Strain gauge bridge	Strain gauge bridge
Meas. roller deflection:	0.5 mm max.	0.5 mm max.
Signal processing:	Analog (Option: digital)	Analog (Option: digital)
Output signal:	Standard: 0 - 1 V DC (analog) Option: 0 - 10 V DC, 4 - 20 mA, mV/V (analog) Option: RS 232 (digital)	Standard: 0 - 1 V DC (analog) Option: 0 - 10 V DC, 4 - 20 mA (analog) Option: USB, RS 422 (digital)
Output plug:	Female diode plug bayonet cap	Female M9 sub-miniatur connector
Damping (f <sub>g</sub> ):	Standard: 30 Hz (other values on request)	Standard: 30 Hz (other values on request)
Temperature drift:	Less than ±0.05 % FS*/°C	Up to FS1-200 less than ±0.2 % FS*/°C From FS1-500 less than ±0.05 % FS*/°C
Temperature range:	10 - 45 °C	10 - 45 °C
Air humidity:	85 % RH, max.	85 % RH, max.
Power supply:	+ 15 ... 24 V DC, 21 mA (regulated); Code A3: 50 mA, Code 232: 40 mA, Code A10: max. + 5 VDC, max. 20 mA	+ 15 ... 24 V DC, 21 mA (regulated); Code A3: 50 mA, Code 422: 50 mA, Code 232: 40 mA
Housing material:	Aluminium	Aluminium
Weight, net (gross):	up to TS1-1000 approx. 250 g (400 g) TS1-2000 - TS1-10K approx. 280 g (430 g) TS1-20K and TS1-50K approx. 330 g (500 g)	Up to FS1-1000 approx. 250 g (350 g) FS1-2000 to FS1-10K approx. 280 g (380 g) FS1-20K and FS1-50K approx. 330 g (500 g) Up to FS1-1000-422 approx. 350 g (450 g) FS1-2000-422 to FS1-10K-422 approx. 400 g (500 g) FS1-20K-422 to FS1-50K-422 approx. 470 g (630 g)
<b>Delivery includes:**</b>	<b>Tension Sensor with transport packaging</b>	<b>Tension Sensor with transport packaging</b>

\* FS = FullScale; \*\*plug and cable are not included

Model with tension range

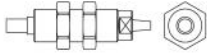
Code for guide rollers  
(if not standard)

Code for output signal/  
power supply  
(if not standard)

Complete Order No.

To place an order  
please indicate the complete model number, e.g.:

**FSL-500** + **T** + **USB** = **FSL-500-T-USB**



## Series SF

Different tension ranges  
up to max. 2000 N

### Special features:

- + Precision DMS sensor with best accuracy
- + High overload protection
- + Direct, axial force application
- + The adjustable axial mounting depth enables an accurate positioning of the guide roller
- + Rugged, stainless steel housing
- + Output signal mV/V without integrated amplifier
- + Supplied with a 5 m shielded cable with bare leads, optional available with plug connection
- + Required power supply max. +10 V DC regulated
- + Easy mounting of SCHMIDT rollers or customer provided rollers
- + Special design for explosive areas on request

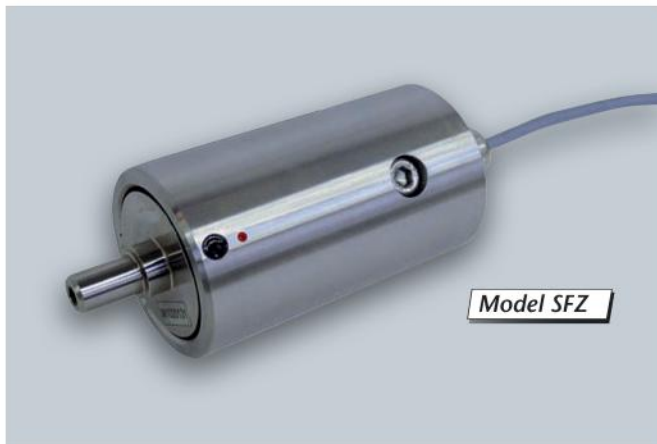
Tension indicator  
and amplifier  
page D 17 - D 18

## Model SFZ

8 tension ranges from 0 - 10 N up to 2000 N

### Special features:

- + Easy mounting by using a mounting hole (Ø50 mm)
- + 10 times overload protection, max. 3200 N
- + Axle journal with Ø 10 mm for guide rollers (15 and 17 mm optional)
- + Different mounting devices optional available
- + IP 67 protected, optional IP 54



Model SFZ

Tension sensor - single roller system - for  
installation at an existing deviating pulley

## Model SFD

6 tension ranges from 0 - 10 N up to 500 N

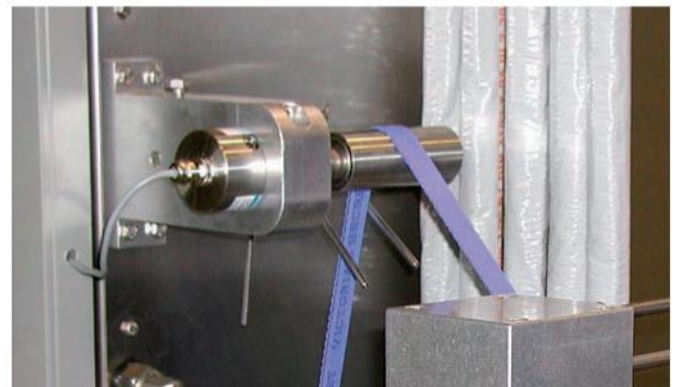
### Special features:

- + Threaded housing with lock-nuts permits easy mounting and simple alignment at a deviating point
- + 10 times overload protection, max. 2000 N
- + Two mounting nuts wrench size 32
- + Axle journal with Ø 10 mm for guide rollers
- + IP 54 protected



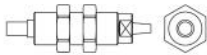
Model SFD

SFD with and  
without guide roller

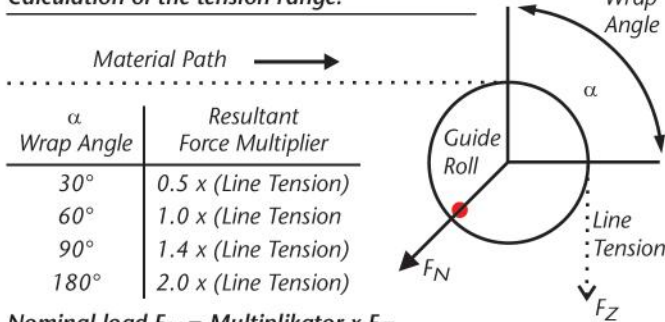


The sensor can be mounted at an existing deviating point. It is important that the entry angle and exit angle are constant.





**Calculation of the tension range:**



Nominal load  $F_N = \text{Multiplikator} \times F_Z$

Recommended wrapping angle 20... 180°

**Available Models**

MODEL	Nominal Load N	MODEL	Nominal Load N
<b>SFZ-10</b>	10	<b>SFD-10</b>	10
<b>SFZ-20</b>	20	<b>SFD-20</b>	20
<b>SFZ-50</b>	50	<b>SFD-50</b>	50
<b>SFZ-100</b>	100	<b>SFD-100</b>	100
<b>SFZ-200</b>	200	<b>SFD-200</b>	200
<b>SFZ-500</b>	500	<b>SFD-500</b>	500
<b>SFZ-1000</b>	1000		
<b>SFZ-2000</b>	2000		

**Cable Connection**

**Code T (Standard)**  
Axial output with screwed cable gland and open ends.  
Cable length 5 m

**Code N2**  
Axial output with straight plug connection M12 and open ends.  
Cable length 5 m

**Code S2**  
Axial output with right-angled plug connection M12 and open ends.  
Cable length 5 m

**Axle Journal**

Axle Journal	Axle $\varnothing$ - in mm	Suitable Bearing
<b>A (Standard)</b>	10f7	6000/6300
<b>B</b>	15f7	6002/6302 (only SFZ)
<b>C</b>	17f7	6003/6303 (only SFZ)

**Options**

Options	Model SFZ
<b>Code R</b>	A radial output in combination with Code T, N2, and S2 is optional available
<b>Code P</b>	Model with less protection class IP54
<b>SFZ-AN</b>	Flange for mounting the sensor (stainless steel)
<b>SFZ-KB</b>	Clamping block for mounting the sensor (aluminium alloy)

**Specifications**

	Model SFZ	Model SFD
Accuracy:	0.5% full scale or better	
Overload protection:	10 times (max. 3200N)	10 times (max. 2000N)
Max. operation force:	160% of nominal load, overload protection afterwards	
Max. lateral force:	max. 100% of nominal load	
Output signal:	up to 20N: 1 mV/V from 50N: 1.5 mV/V	1 mV/V
Power supply:	max. +10 V DC, regulated	max. +10 V DC, regulated
Temperature range:	-10... +70°C	-10... +70°C
Bridge resistor:	700Ω	350Ω

Model with tension range

Axle journal

Cable connection/  
Options

Complete Order No.

To place a order:  
please indicate the complete model number e.g.

**SFZ-50** + **A** + **N2** = **SFZ-50-A-N2**



# SC SERIES

## Tension indicator with data analysis for one sensor

SCHMIDT indicators are available for all SCHMIDT tension sensors.

### SC Series Standard features

- For sensors with output signal 0 - 1 V
- For sensors *without* amplifier the special designed display unit *SC-PMD* with integrated amplifier can be used
- Connection for one sensor
- Power supply for connected sensor
- Sensor calibration adjustment (Zero and Gain)
- Analog output 0 - 10 VDC
- User-set damping for output signal and display
- Dotmatrix LCD display
- CE certified with sensor connected
- Software »Tension Inspect 3« for displaying and saving readings on a PC - optional (see page C9)

### Model SCV-1

## Strain gauge amplifier for sensor without integrated amplifier Code A10



### Model SC-PM/SC-PMD

#### Special features:

- + Panel-mount digital display
- + Output 0 - 10 V analog (option: RS232, RS422 or current)
- + MIN- and MAX-limits with color-coded indicators and open collector
- + Calibration of 3 different materials can be saved
- + Power supply through separate AC adapter or customer side

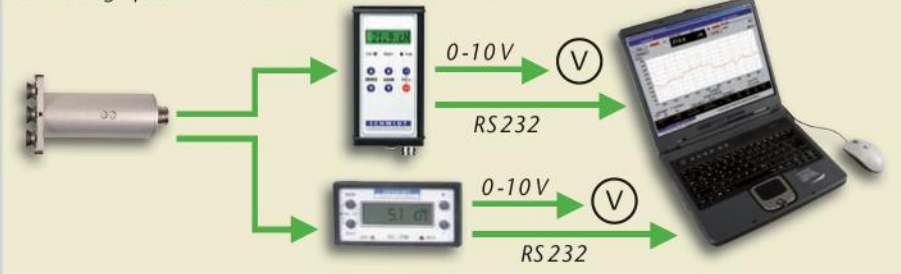


### Model SCD-1

#### Special features:

- + Desktop indicator
- + Output 0 - 10 V analog, RS 232 digital,
- + MIN- MAX-limits with color-coded indicators and open collector output
- + Power supply through separate AC adapter

Connecting options of indicators to a controller or a PC



#### Special features:

- + Connection for one Sensor
- + DIN-Rail housing (17.5 mm) for convenient snap-in installation
- + Output signal: 0 - 1 VDC (optional 0 - 10 VDC or 4 - 20 mA)
- + Sensor calibration adjustment (zero and gain)
- + CE certified with sensor connected

#### Output Signal

Standard	Analog output 0 - 1 V DC
Code A2	Analog output 0 - 10 V DC
Code A3	Current output 4 - 20 mA

#### Specifications

→ see page D 18 →

Connection of strain gauge amplifier



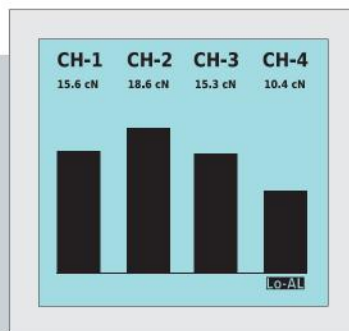




**Model SC-PM4/SC-PMD4**

**Special features:**

- + For connecting max. 4 sensors with different tension ranges
- + Panel mount display unit
- + LCD Display with 2 display modes:
  - readings with alarm control
  - bar graph, reading and alarm control
- + Output signal: USB and RS422, optional analog 0-10V DC
- + 4 material curves can be calibrated and stored per channel
- + MIN and MAX limits with open collector output for each channel
- + Password protected set-up menu



Display with bar graphs



Software »Tension Inspect«

**Tension indicator with data analysis for max. 4 sensor**

**Standard features**  
**Model SC-PM4 and SC-PMD4**

- For sensors without amplifier (Code A10) the special designed display unit SC-PMD4 with integrated amplifier can be used
- Power supply for connected sensor
- Selectable measuring units
- User-set damping for output signal and display
- With AC adapter or customized power supply
- CE certified with sensor connected
- Software »Tension Inspect 3« for displaying and saving readings on a PC - optional (see page C9)



Specifications	SC-PM	SC-PMD	SCD-1	SCV-1	SC-PM4	SC-PMD4
Digital display:	8 digit LCD		8 digit LCD		Graphical display	
Height of digit:	12mm		12 mm			
Units of measure:	cN, daN, g or kg		cN, daN, g or kg		cN, daN, g, kg, lb or oz	
Damping (f <sub>g</sub> ):	Electronic adjustable		Electronic adjustable		Electronic adjustable	
Output signal:	0-10V DC option: RS232, RS422, 4-20 mA		0-10V DC, RS232	0-1V DC Option: 0-10V DC, 4-20 mA	USB and RS422 Option: 0-10V DC	
Amplifier integrated:	no <input type="checkbox"/> yes <input checked="" type="checkbox"/>		no	yes <input checked="" type="checkbox"/>	no <input type="checkbox"/> yes <input checked="" type="checkbox"/>	
Input signal:	0-1V DC <input type="checkbox"/> mV/V <input checked="" type="checkbox"/>		0-1V DC	mV/V	0-1V <input type="checkbox"/> mV/V <input checked="" type="checkbox"/>	
Exit hub:	Terminal strip		2x Mini-DIN (PS2)	Terminal strip	Terminal strip	
Power supply:	15 ... 24 V DC, 100 mA		15 ... 24 V DC, 100 mA	15 ... 24 V DC, 50 mA	30V DC, 200 mA	
AC adapter:			100-240VAC, 50-60Hz, with 3 adapters (EU/USA/UK)			
Alarm output:	30V DC, 20 mA, open collector		30V DC, 20 mA, 2x open collectors		30V DC, 20 mA, open collectors	
Housing:	Plastic		Aluminium	Plastic	Plastic	
Dimensions (LxWxH):	120 x 95 x 48 mm		182 x 85 x 34 mm	90 x 56 x 18 mm	110 x 90 x 90 mm	
Cutout required:	92 x 44 mm			DIN top hat rail box	91.5 x 91.5 mm	
Weight, net (gross):	Approx. 200g (300g)		Approx. 300g (1000g)	Approx. 53g	Approx. 300g (700g)	



**SCHMIDT Guide Roller Dimensions**

**Standard** All dimensions are given in mm

<p><b>Standard</b></p> <p>MODEL <b>ZF2</b> <b>DXE</b> <b>DXV</b> <b>ZEF</b> <b>DTSE</b> <b>DTXE</b> <b>DXES</b> <b>MAZF</b> <b>MBZF</b></p>	<p><b>Standard</b></p> <p>MODEL <b>ZD2</b> <b>DX2</b> <b>DN1</b> <b>DX2S</b> <b>ZED</b> <b>DTS</b> <b>DTX</b> <b>MAZD</b> <b>MBZD</b></p>	<p><b>Standard</b></p> <p>MODEL <b>Q</b> <b>MK</b> <b>MKM</b> <b>DN1-30K-L</b> <b>DN1-50K-L</b></p>	<p><b>Standard</b></p> <p>MODEL <b>TS1</b> <b>FS1</b></p>
<p><b>Standard</b></p> <p>MODEL <b>DXF</b> <b>DXFS</b> <b>DTSF</b> <b>DTXF</b> <b>TSL</b> <b>FSL</b></p>	<p><b>Standard</b></p> <p>MODEL <b>DXL</b> <b>DTSL</b> <b>DTXL</b> <b>TSR</b> <b>TSH</b> <b>FSH</b> <b>FSR</b></p>	<p><b>Standard</b></p> <p>MODEL <b>TSF</b> <b>Option</b> <b>TSR</b> <b>FSR</b></p>	<p><b>Tape rollers</b> a from 7 mm to 100 mm</p> <p>MODEL <b>DXB</b> <b>DXR</b> <b>DXT</b> <b>DTXB</b> <b>TSB1</b> <b>TSB2</b> <b>FSB1</b> <b>DXBS</b> <b>DXTS</b> <b>MBZB</b></p>

**Optional** All dimensions are given in mm

<p><b>Code T</b> Plastic (POM) black</p> <p><b>Code W</b> Nickel-plated steel</p> <p>MODEL <b>ZF2</b> <b>DXE</b> <b>DXV</b> <b>DXES</b> <b>ZEF</b> <b>DTSE</b> <b>DTXE</b></p>	<p><b>Code T</b> Plastic (POM) black</p> <p><b>Code W</b> Nickel-plated steel</p> <p>MODEL <b>ZD2</b> <b>DX2</b> <b>Q</b> <b>MK</b> <b>DN1</b> <b>DX2S</b> <b>ZED</b> <b>DTS</b> <b>DTX</b> <b>TS1</b> <b>FS1</b></p>	<p><b>Code H</b></p> <p>MODEL <b>ZD2</b> <b>DX2</b> <b>DN1</b> <b>DX2S</b> <b>ZED</b> <b>DTS</b> <b>DTX</b> <b>TS1</b> <b>FS1</b> <b>MAZD</b> <b>MBZD</b></p>	<p><b>Code U</b></p> <p>MODEL <b>DX2</b> <b>DN1</b> <b>DX2S</b> <b>DTS</b> <b>DTX</b> <b>TS1</b> <b>FS1</b></p>
<p><b>Code CE2</b> Aluminium ceramic-coated</p> <p>MODEL <b>ZD2</b> <b>DX2</b> <b>DN1</b> <b>DX2S</b> <b>DTS</b> <b>DTX</b> <b>TS1</b> <b>FS1</b></p>	<p><b>Code ST</b></p> <p><b>Code B</b></p> <p>MODEL <b>ZD2</b> <b>DX2</b> <b>DN1</b> <b>DX2S</b> <b>DTS</b> <b>DTX</b> <b>TS1</b> <b>FS1</b></p>	<p><b>Code ASY</b></p> <p><b>Code ASYB</b></p> <p>MODEL <b>DX2</b> <b>DN1</b> <b>DX2S</b> <b>DTS</b> <b>DTX</b> <b>TS1</b> <b>FS1</b> <b>Standard</b> <b>DNW</b></p>	<p><b>Code R1</b></p> <p>MODEL <b>DXL</b> <b>DTSL</b> <b>DTXL</b> <b>TSR</b> <b>TSH</b> <b>FSR</b> <b>FSH</b></p>

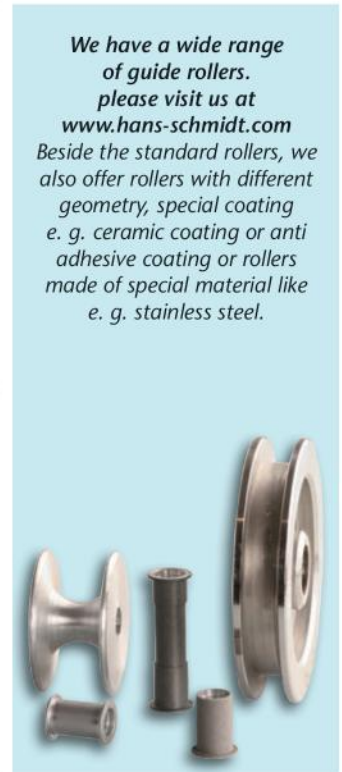
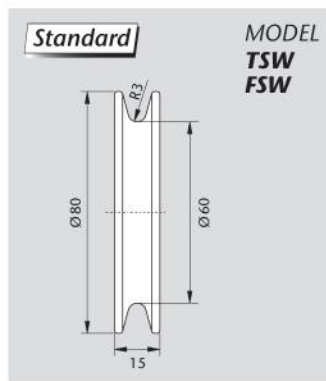
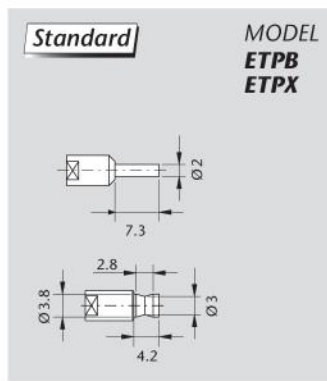
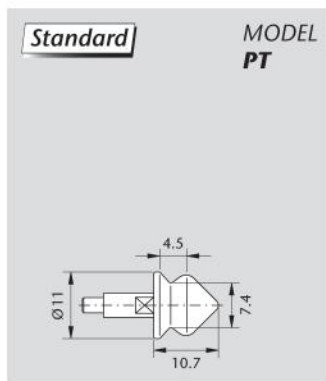
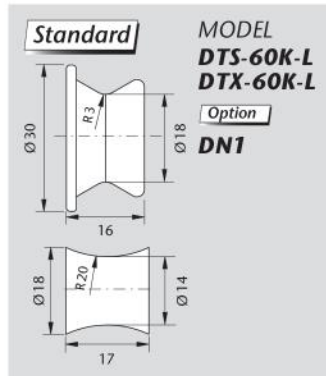
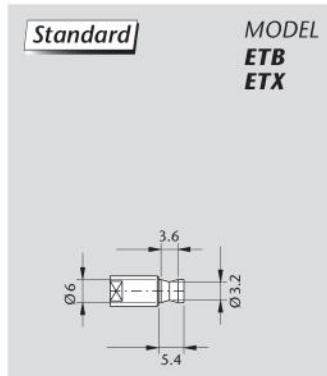
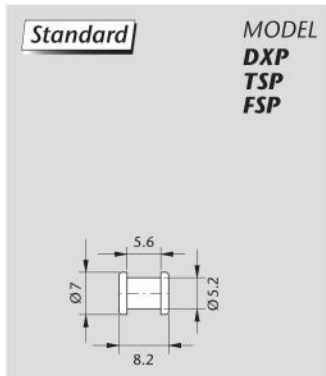
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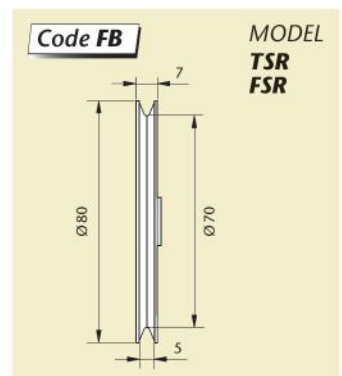
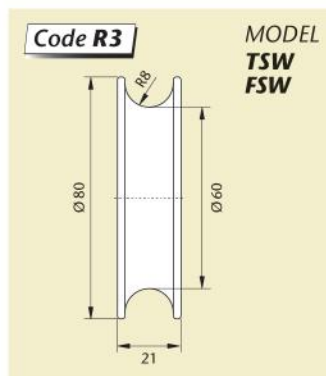
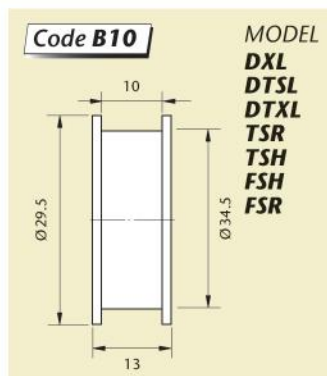
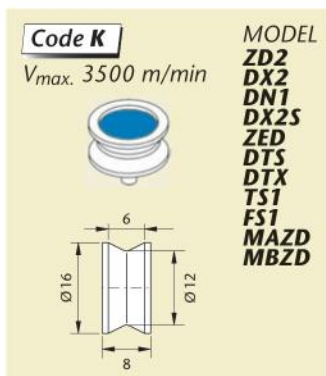
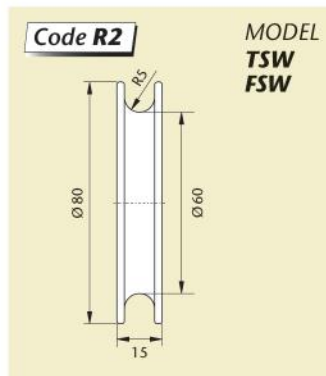
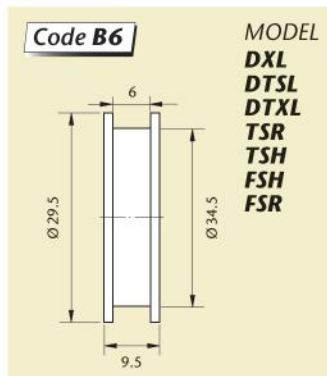
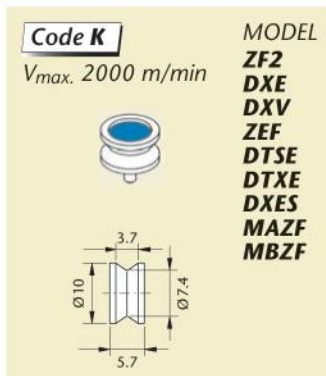


**SCHMIDT Guide Roller Dimensions**

**Standard** All dimensions are given in mm



**Optional** All dimensions are given in mm



Subject to change without notice.



If our standard instruments cannot be used we try to modify our standard models according your demand profile. Please inform us about your application requirements.

## Tension Meter for hand-held use



**Model DX2**  
With splash water protection, as far as possible nickel-plated components are used



**Model DX2**  
With extension handle and ceramic pins to reach critical measuring positions



**Model DX2**  
With extended measuring head for difficult to reach measuring positions



**Model ET**  
With small guide rollers for special material path



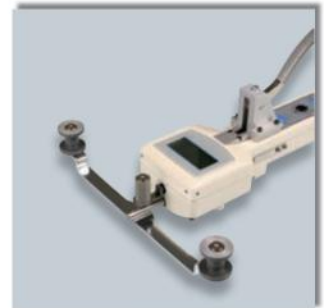
**Model DXX**  
With big rollers and high range up to 80 daN using a unique rope catching system



**Model DXR**  
With small, both-sided ball bearing mounted rollers for high tensions up to 50 daN



**Model DTMB**  
With extended measuring feeler for difficult to reach measuring positions



**Model DTBB**  
Equipped with tape rollers with big flanges for better material control

## Tension Meter for online use



**Model TSB1**  
With wide special guide rollers made of stainless steel



**Model TS1**  
Sensor with non-rotating ceramic pin and outside rollers, as well as fiber guide plates



**Model TSF**  
Tape roller with big Ø for fragile materials to be measured, as fiber optics or glass fiber strands



**Model TSB**  
1-roller-system with anti adhesive coating, e.g. scotch tape foils



**Model TSB2**  
Crank handle to open or close the sensor, as well as non-rotating ceramic tape roller



**Model TSH**  
Special designed guide rollers with special coating for carbon fibers CFK



**Model TS1**  
With additional guide roller to prevent the wire to jump of the roller



**Model TSB2**  
With non-rotating ceramic pins for cellulose acetat





*Note*

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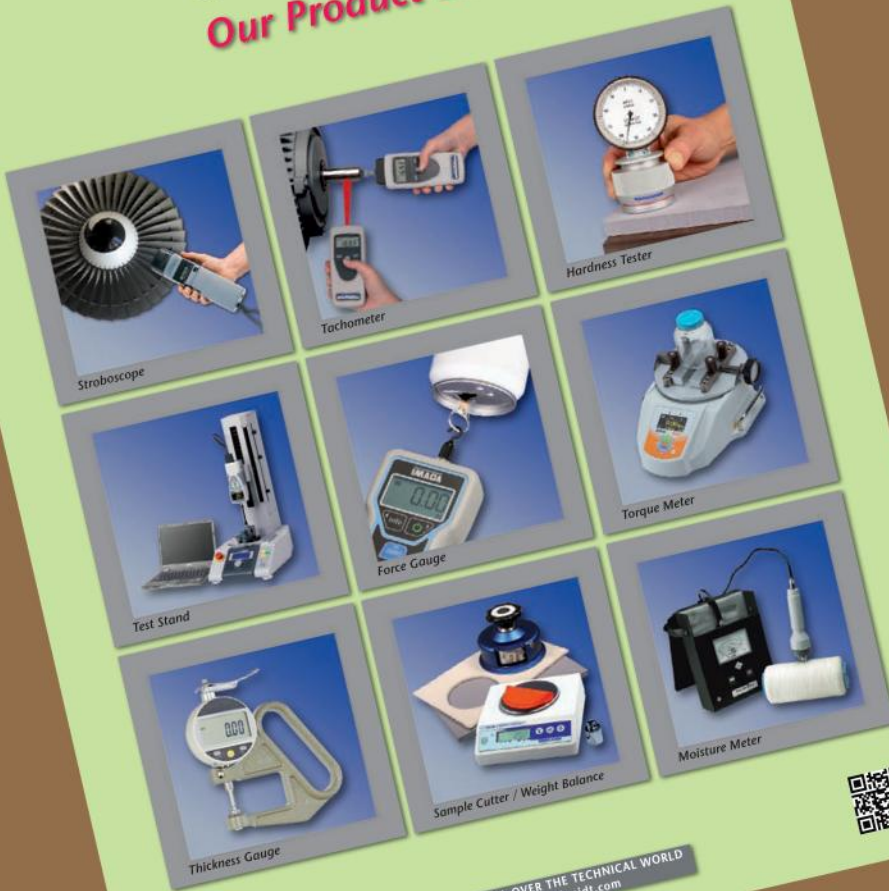
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Version E12/2018

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